NC DEPARTMENT OF
HEALTH AND
HUMAN SERVICES
Division of Health Service Regulation

State-approved Curriculum
Nurse Aide I Training Program

MODULE H
Body Systems

Teaching Guide
2024 Version 1.1

North Carolina Department of Health and Human Services
Division of Health Service Regulation
North Carolina Education and Credentialing Section

Module H – Body Systems
Teaching Guide

Objectives

1. Describe cell theory and the organization of the human body.
2. Identify the structure and function of the cell, variations of a normal cell, and nurse aide's role when caring for someone with cancer.
3. Identify the structure and function of the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems.
4. Identify changes due to aging of the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems.
5. Compare and contrast normal findings and variation of normal findings and variation of the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems
6. Describe common disorders of the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems.
7. Describe the nurse aide's role related to a resident's integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems.

Advance Preparation – In General

- Review curriculum and presentation materials
- Add examples or comments in Notes Section
- Set up computer/projector
- Establish Internet connection
- **#H22 Decide whether Alternative Classroom Instruction exercise will be completed in place of traditional lecture for the following body systems, integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems. *All activities are still required if the alternative instructional method is chosen.* Refer to Module H Teaching Guide- Appendix 1 Alternative Classroom Instruction at the end of this guide. For further information related to cooperative learning strategy, Carousel, see links below.**
  - **https://shelleygrayteaching.com/carousel/**
  - **https://www.acteonline.org/teaching-strategy-the-carousel/**

Supplies

- Posterboard and colored markers for the **Alternative Classroom Instruction if used.**
- Male/female mannequin(s) (**Activity** #H143)
- A skeleton (**Teaching Tip** #H49)
- 28-feet of cheap cord or rope (**Activities** #H126 and #H126-1)
- 2 brightly colored straws, preferably in different colors or 2 per student – instructor's choice (**Activity** #H143)
- Urine display – 3 specimen cups with lids, a small amount of sand, yellow food coloring, red food coloring (**Teaching Tip** #H147)

- **Activity** #H174
  - Card stock paper or computer paper (with access to a laminator)
  - Pair of goggles
  - Petroleum jelly or water-soluble lubricant
  - Mannequin in a bed
  - Cotton balls, at least 12 per student
  - Sewing needle and 2-foot piece of thread
  - Newspaper
  - Small change purse with 2 or 3 dimes in it
  - A pair of gloves for each student
  - Pair of extra-large pants
  - Chair
  - Walker
  - Blindfold, scarf, or headband
  - A meal tray with 3 different foods (such as pudding, applesauce, fruit cocktail, cottage cheese, gelatin, etc.) that will not be eaten, placed on the plate, and covered with plastic wrap
  - Generic diet card
  - Plastic wrap

Handouts- Optional

Instructional Resources/Guest Speaker- Optional

Advance Preparation – Teaching Tips

- **#H33 Evolution of a Pressure Injury Class/Independent Project:**

In preparation for curriculum content on pressure injuries, early in the course, divide the class equally into teams so that the following concepts will be researched by and presented in class:

1. Introduction of topic including an overview, statistics, and the Centers for Medicare and Medicaid Services (CMS)
2. Define, describe, and demonstrate the following terms – pressure, bony prominence, shear, and friction, and their relationship to pressure injuries
3. Residents at risk
4. Stages of pressure injury
5. Pressure points
6. Prevention

If class numbers do not allow for team assignments, then convert this activity to an individual project. Encourage creativity. [Ideas: for pressure points, take index cards and label pressure points on a mannequin or label them on an actual person; for stages of pressure injuries, create a model using plumber's putty and little bottles of paint in the crafts' section of your local store OR project images of stages from the internet.] It is up to the individual program as to how to assign a grade for this project, for example, as a stand-alone grade, part of the homework/quizzes grade, or a part of the participation grade.

- **#H49 Model Skeleton**: Use a skeleton to demonstrate structure and function of the skeletal system
- **#H52 Musculoskeletal Movement:** Students follow along with range of motion

- **#H80 Right-brain/Left-brain Dominance:** Review the literature and create a resource folder to use in conjunction with a short discussion about right-brain and left-brain dominance. Locate and use a quiz for students to determine which side of their brains are dominant.
- **#H117 Pursed-Lip Breathing:** Preview the following videos and determine if you would like to use one or both to complement instruction:
  Pursed-Lip Breathing, by the American Lung Association
  https://www.youtube.com/watch?v=7kpJ0QlRss4
  Top 3 Breathing Ex. for COPD -Chronic Obstructive Pulmonary Disease
  https://www.youtube.com/watch?v=oa5Sn-R8FCg
  COPD Breathing Exercise: Pursed Lip Breathing
  https://youtu.be/2utkaRhutJY?si=iaDuZ_b7wxzfJS7c
- **#H122 Positioning and Breathing:** Have students take a couple of deep breaths while seated in their chairs and then have them stand up, bend over, and then take a couple more deep breaths. Ask students Which position was easier to take a deep breath? Explain the importance of positioning residents in bed in a manner to facilitate lung expansion.
- **#H147 Three (3) Simulated Urine Specimens:** Create 3 different urine specimens for students to view and pass around **–** normal urine, urine with red food coloring (blood) and urine with sand/dirt (sediment).

Advance Preparation – Activities

- **#H33 Pressure Injury Presentations - Class or Independent Project:**
  In preparation for curriculum content on pressure injuries, early in the course, divide the class equally into teams so that the following concepts will be researched by and presented in class:
    1. Introduction of topic including an overview, statistics, and the Centers for Medicare and Medicaid Services (CMS)
    2. Define, describe, and demonstrate the following terms – pressure, bony prominence, shear, and friction, and their relationship to pressure injuries
    3. Residents at risk
    4. Stages of pressure injury
    5. Pressure points
    6. Prevention

  If class numbers do not allow for team assignments, then convert this activity to an individual project. Encourage creativity. [Ideas: for pressure points, take index cards and label pressure points on a mannequin or label them on an actual person; for stages of pressure injuries, create a model using plumber's putty and little bottles of paint in the crafts' section of your local store OR project images of stages from the internet.] It is up to the individual program as to how to assign a grade for this project, for example, as a stand-alone grade, part of the homework/quizzes grade, or a part of the participation grade.
- **#H38 Websites:** Familiarize self with web sites that feature images of pressure ulcer staging and project in class
- **#H126 and #H126-1 Simulated Small and Large Intestines:** Measure and cut the cord or rope into 2 pieces – one piece, 23-feet long; and the other piece, 5-feet long. Separately, wind both pieces of rope up in preparation for class.

- **#H143 Female and Male Urethras:** Measure and cut the first straw, 1½ inches and the other one 7 to 8 inches. You may choose to provide sets of pre-cut straws to each student.
- **#H174 Experiencing Changes with Aging and/or Disability:** Print instruction cards using card stock paper or computer paper that you will laminate. Decide how to pair up students and think about special situations (odd number of students, whether you want to set up additional stations beyond the 5 specified). Set up 5 stations in the lab as directed in the instructor guide. Think about how you are going to notify students when it is time to move on to the next station.

Module H – Body Systems
Definition List

Cell Theory

Benign tumor – a non-life-threatening, non-cancerous tumor that does not spread to other body parts

Cell Theory – basic unit of all living tissues or organisms, all living organisms made of cells, and cellular function is essential process of living things

Cells – are building blocks of the human body and when combined, are said to form tissue

Chemotherapy (chemo) – a medical treatment that uses medications given orally or intravenously to kill cancer cells

Connective tissue – tissue that anchors, connects, and supports other tissues; located in every part of the body; bones, tendons, ligaments, and cartilage; blood is a form of connective tissue

Epithelial tissue – tissue that covers internal and external body surfaces; lines nose, mouth, respiratory tract, stomach, and intestines; skin, hair, nails, and glands

Malignant tumor – a cancerous tumor that invades and destroys nearby tissues and can spread to other parts of the body

Metastasis – when a cancer spreads to other parts of the body by breaking off and travelling to other parts of the body

Muscle tissue – tissue that stretches and contracts to let body move

Neoplasia- benign or malignant tumor

Nerve tissue – tissue that receives and carries impulses to the brain

Organ – made of tissue, may be several different types of tissue that carry on a special function, and combine to form a system

Organelle – carry on work of cell

Organism – made up of systems functioning together to perform activities of daily living that are needed for continued life

Orthostatic Hypotension – abnormal low blood pressure occurring when the resident suddenly stands up; resident complains of weakness, faintness, dizziness, and seeing spots

Radiation – a medical treatment that kills cancer cells using X-ray beams aimed at the tumor, or radioactive material implanted at or near the tumor

System – made of groups of several organs functioning together for a specific purpose or purposes

Tissue – cells grouped together to carry out a particular activity or function; when grouped together, tissues become organs

Tumor – growth of abnormal cells which may be benign or malignant

Integumentary System

Avoidable pressure injury – one that develops from improper use of the nursing process

Bedfast – confined to bed

Bony Prominences – areas of body where bone is close to the skin, such as elbows, shoulder blades, sacrum

Deep tissue pressure injury – purple or deep red localized area of discolored intact skin or blood-filled blister; usually due to damage of underlying soft tissue from pressure and/or shear

Dermatitis – inflammation of skin

Dermis – layer of skin under the epidermis

Eczema – red, itchy areas on the surface of skin

Epidermis – outer layer of skin

Friction – rubbing of one surface against another; skin is dragged across a surface

Integumentary System – the skin; the largest organ and system in the body, responsible for providing a natural protective covering of the body

Pressure injury (pressure ulcer) – any lesion caused by unrelieved pressure that results in damage to underlying tissues

Pressure injury stage 1 – intact skin; redness over bony prominence

Pressure injury stage 2 – skin loss (partial-thickness); may see a blister or shallow reddish-pink ulcer; the blister may be intact or open

Pressure injury stage 3 – skin loss (full-thickness); skin gone; may see subcutaneous fat; slough (dead soft tissue, often moist and varies in color – white, yellow, green, or tan) may be present; could be attached or stringy loose

Pressure injury stage 4 – full-thickness skin and tissue loss with muscle, tendon, and bone exposure; slough and eschar (thick, leathery dead tissue that may be loose or attached to skin); often black or brown

Shear – when layers of skin rub up against each other; or it could be when skin remains in place, but tissues underneath move and stretch causing damage to capillaries and blood vessels

Shingles (Herpes Zoster) – a disease caused by a virus, most common in people over 50, with signs that include a rash or blisters on one side of the body, burning pain, numbness, and itching

Stasis Dermatitis – a skin condition affecting lower legs and ankles that occurs from a buildup of fluid under the skin and causes problems with circulation

The 30º lateral position – position of a resident when the bed is not raised more than 30º and pillows are placed under the head, shoulder, and leg to lift the hip at about a 30º angle to avoid pressure on the hip

Unavoidable pressure injury – a pressure injury occurs despite efforts to prevent one through proper use of the nursing process

Unstageable pressure injury – full-thickness tissue loss with injury covered by slough and/or eschar

<u>Musculoskeletal System</u>

Abduction – moving a body part away from the midline

Adduction – moving a body part toward the midline

Amputation – removal of all or part of a limb because of a disease or an accident

Arthritis – Inflammation or swelling of the joints causing stiffness, pain, and decreased mobility

Ball-and-socket joint – a joint that allows movement in all directions, made up of the rounded end of one bone fitted into the hollow end of another bone, for example, the hip and the shoulder

Bone Marrow – soft and spongy tissue located in the inside part of the bone

Bones – hard and rigid structures that make up the skeleton and together form the framework of the body

Cardiac Muscle – striated, involuntary muscle of the heart

Cartilage – connective tissue that cushions bones at the joints and keeps them from rubbing together

Closed fracture – a broken bone that does not break the skin

Contracture – permanent shortening of muscle resulting in immovable joints

Dorsiflexion – bending the toes and foot upward at the ankle

Extension – straightening a body part

External Rotation – turning the joint outward

Flexion – bending a body part

Fracture – break in the bone caused by an accident or osteoporosis

Hinge joint – a joint that allows movement in one direction, for example, the elbow and knee

Hip Fracture – a serious condition involving a break in the hip bone due to an accidental fall or a fall from weakened bones

Internal Rotation – turning the joint inward

Involuntary muscle – a muscle that works automatically and cannot be controlled

Joints – the point where bones meet, made up of connective tissue called cartilage that cushions bones and keeps them from rubbing together during movement

Ligaments – connect bone to bone

Muscle atrophy – the wasting away of a muscle due to disuse, causing a decrease in size and increase in weakness of the muscle

Muscle Strain – damage of the muscle caused by trauma

Muscles – structure of the body that powers movement of skeleton and helps body stay erect

Musculoskeletal System – system of the body that provides structure and movement for the body

Open fracture (compound fracture) – a broken bone that breaks through the skin

Opposition – touching the thumb to a finger of the same hand

Osteoarthritis – degenerative joint disease affecting the elderly and may occur with aging or joint injury, usually involving weight-bearing hips and knees

Osteoporosis – loss of bone density causing bones to become porous and brittle, resulting in bones breaking easily

Phantom pain – pain experienced in the area that a body part has been amputated possibly due to damaged nerve endings

Phantom sensation – the feeling that an amputated body part is still there

Pivot joint – a joint that allows turning from side to side, for example, the skull connected to the spine

Plantar Flexion – bending the foot downward at the ankle

Pronation – turning downward

Prosthesis – device that replaces body part that is missing or deformed

Rheumatoid Arthritis – systemic, crippling disease-causing deformities, with stiff, painful, swollen joints

Skeletal muscle – striated voluntary muscles attached to the bones that powers movement of the skeleton

Smooth Muscle – involuntary muscle of the inner linings of organs, such as the stomach, intestines, blood vessels, and others

Sprain – stretched or torn ligaments or tendons

Supination – turning upward

Synovial membrane – lining of the joints that secretes synovial fluid that acts as lubricant allowing joints to move smoothly

Tendons – connect muscle to bone

Total Knee Replacement (TKR) – surgical replacement of the knee with a prosthesis performed to relieve pain and restore mobility, damaged by arthritis or injury

Voluntary muscle – a muscle that can be controlled

<u>Nervous System</u>

Brain – located in the skull and consists of three parts – cerebrum, cerebellum, and the brainstem

Brainstem – part of the brain that controls breathing, opening, and closing of blood vessels, heart rate, swallowing, gagging, and coughing

Central nervous system (CNS) – one of the two divisions of the nervous system that includes the brain and spinal cord

Cerebral cortex – outer layer of the cerebrum where ideas, thinking, analysis, judgment, emotions, and memory occurs; also, guides speech, interprets messages from senses, and controls voluntary muscle movement

Cerebrovascular accident (CVA, stroke) – damage to part of the brain due to blood clot or hemorrhage cutting blood supply off

Cerebellum – part of the brain located just below the cerebrum that controls balance and regulates movement

Cerebrum – center of the brain where thought and intelligence occur and is divided into two hemispheres and four lobes

Cognitive impairment – poor judgment, memory loss, inability to solve problems, confusion

Dysphagia – difficulty swallowing

Emotional lability – inappropriate or uncalled for laughing, crying, or expressions of anger

Expressive aphasia – trouble communicating thoughts by speech or writing

Frontal lobe – lobe of the cerebrum important for cognitive functions and control of voluntary movement or activity

Head and spinal cord injuries – injuries resulting from diving accidents, sports injuries, motor vehicle accidents, and war injuries, resulting in mild concussion to coma, paralysis, and death

Hemiparesis – weakness on one side of body

Hemiplegia – paralysis on one side of body

Left hemisphere of the cerebrum – the half of the cerebrum that controls the right side of the body

Nerves – structures that are made up of nerve cells or neurons that carry messages to and from the brain and to and from the rest of the body

Nervous System – the control and message center of the body

Neurons – nerve cells and basic unit of the nervous system

Occipital lobe – lobe of the cerebrum primarily responsible for vision

Paraplegia – complete loss of function occurs to the lower body

Parietal lobe – lobe of the cerebrum that processes information about temperature, taste, touch, and movement

Paresis – loss of use of muscle function affecting only part of body

Parkinson's Disease – progressive, incurable disease that causes a part of the brain to degenerate, resulting in stiffening muscles, shuffling gait, and bent posture

Peripheral nervous system – one of the two divisions of the nervous system that includes nerves that travel throughout the body

Quadriplegia – complete loss of function occurs to lower and upper body, plus trunk

Receptive aphasia – difficulty understanding spoken or written words

Right hemisphere of the cerebrum – the half of the cerebrum that controls the left side of the body

Sensory Organs - receive impulses from environment and relay impulses to brain including skin, tongue, nose, eyes, and ears

Spinal Cord – located within the spine, connected to the brain, and conducts messages between the brain and the body by pathways

Temporal lobe – lobe of the cerebrum that processes memories, integrating them with sensations of taste, sound, sight, and touch

<u>Cardiovascular System</u>

Angina pectoris (angina) – chest pain occurring when the heart muscle is not getting enough oxygen due to narrowed blood vessels, brought about by exercise, stress, excitement, or digesting a big meal

Arteries – blood vessels that carry blood with oxygen and nutrients away from the heart and to the cells

Atherosclerosis – arteries harden due to plaque build-up from fatty deposits; often referred to as "hardening of the arteries"

Cardiovascular System – also called the circulatory system and is the continuous movement of blood though the body

Congestive Heart Failure (**CHF)** – when one or both sides of the heart stop pumping effectively

Coronary Artery Disease (CAD) – a condition in which blood vessels in the coronary arteries narrow, lowering blood supply to the heart and depriving it of oxygen

Hypertension – high blood pressure

Myocardial Infarction (MI, heart attack) – a condition where the heart muscle does not receive enough blood and lacks oxygen, causing damage or death to that area of the heart

Peripheral Vascular Disease (PVD) – poor circulation of legs, feet, arms, hands due to fatty deposits that harden in blood vessels

Varicose Veins – enlarged, twisted veins usually in the legs

Veins – blood vessels that carry blood with waste products away from the cells and to the heart

Respiratory System

Apnea – no breathing

Asthma – chronic inflammatory disease occurring when the respiratory system reacts quickly and strongly to irritants, such as pollen and dust, characterized by difficulty breathing, wheezing, and a sense of tightness or constriction in the chest due to spasm of the muscles

Bradypnea – a respiratory rate less than 12 breaths per minute

Cheyne-Stokes – alternating periods of slow, irregular breathing and rapid, shallow breathing, plus short periods of absent breathing

Chronic bronchitis – chronic irritation and inflammation of bronchi usually caused by smoking

Chronic Obstructive Pulmonary Disease (COPD) – chronic, progressive disease of the lungs causing trouble breathing, particularly getting air out of lungs; includes chronic bronchitis and emphysema

Cyanosis – changes in skin color, pale or bluish color of lips and extremities

Dyspnea – difficulty breathing

Emphysema – chronic, progressive disease of the lungs causing irreversible damage, usually resulting from chronic bronchitis and smoking

Exhale – when carbon dioxide is expelled out of the nose and the mouth from the lungs

Expiration – involves the breathing out of carbon dioxide

Inhale – when air (or oxygen) is pulled in through the nose and down into the lungs

Inspiration – involves the breathing in of oxygen

Lobes – segments or areas of the lung

Lower Respiratory Tract – consists of lower trachea, bronchi, and lungs

Lungs – elastic, spongy, cone-shaped air-filled structures involved in respiration

Pneumonia – acute (sudden onset) infection of the lung or lungs caused by bacteria, virus, or fungus

Pursed-lip breathing – an assistive breathing pattern for residents with chronic lung disease that requires inhaling slowly through nose and exhaling slowly through pursed lips (as if about to whistle)

Respiratory System – involves the breathing in of oxygen (inspiration) and the breathing out of carbon dioxide (expiration)

Tachypnea – a respiratory rate more than 20 breaths per minute

Thorax – closed cavity of the body that contain the structures needed for respiration, extending from the base of the neck to the diaphragm

Upper Respiratory Infection (URI, cold) – viral or bacterial infection of nose, sinuses, and throat with nasal drainage, sneezing, sore throat, fever, and tiredness

Upper Respiratory Tract – consists of nose, mouth, sinuses, pharynx, larynx, and top of trachea

Digestive System

Bowel Movement (feces, stool, BM) – semi-solid material made of water, solid waste, bacteria, and mucus that is eliminated via the anus

Colostomy – a surgically created opening (stoma) through the abdomen into large intestine to allow stool to be expelled into a bag affixed to the abdomen

Constipation – inability to have a stool or infrequent, difficult, and possibly painful elimination of a hard, dry stool

Defecation – the passage of the bowel movement from the large intestines out of the body through the anus; bowel elimination

Diarrhea – liquid stool

Digestive System – also known as the digestive system, extends from the mouth to the anus, and responsible for digestion and elimination

Enema – specific amount of water that may or may not have an additive and is inserted into the colon to stimulate passage of stool

Esophagus – the food tube of the body between the throat and the stomach

Fecal Impaction – hard stool stuck in the rectum and cannot be expelled, resulting in ongoing constipation

Feces – tubular shaped stool passed from the rectum

Flatulence – gas

Gastritis – inflammation of the stomach lining

Gastric ulcer (peptic ulcer) – raw sores in stomach caused by excessive acid secretion

Gastroesophageal reflux disease (GERD) – chronic condition when liquid contents of the stomach back up into the esophagus and that can damage the lining of the esophagus

Incontinence of stool – not able to control bowel movements, leading to an unintentional, spontaneous passage of stool

Intestines (small and large) – lower GI structures

Peristalsis – involuntary contractions that move food through the digestive system

Ulcerative Colitis – chronic inflammatory disease of large intestine; serious condition that can result in a colostomy

Urinary System

Benign Prostatic Hypertrophy (BPH) – enlargement of prostate gland, a donut-shaped structure around the male urethra, leading to urinary dysfunction

Chronic Kidney Disease (CKD) – damage of the kidneys that worsens gradually

Cystitis – inflammation of bladder due to infection

Dysuria – painful urination

Functional incontinence – loss of urine caused by cognitive, physical, or environment reasons

Hematuria – blood in the urine

Kidney Stones (renal calculi) – jagged stones formed when urine crystallizes in the kidneys that can block kidneys and ureters causing excruciating pain

Kidneys – paired organs responsible for filtering waste products from the blood and producing urine

Nephritis – inflammation of kidney due to infection

Overflow incontinence – loss of urine due to bladder overflow or distention

Retention – inability to completely empty the bladder

Stress incontinence – loss of urine with sneezing or coughing

Ureters – two narrow tubes that connect the kidneys to the urinary bladder

Urethra – a tube located between the urinary bladder to the outside of the body

Urge incontinence – involuntary loss of urine from a sudden urge to void

Urinary Bladder – muscular sac that stores the urine until it passes from the body

Urinary Incontinence – inability to control the bladder leading to an involuntary loss of urine

Urinary System – the filtering system of the body, responsible for ridding body of waste products from blood

Urinary Tract Infection (UTI) – an infection of urethra, bladder, ureter, or kidney typically caused by E. coli, a bacteria found in the digestive system

Urination (micturition, voiding) – the passing of urine from the bladder through the urethra to the outside of the body

Urine – made up of water, salt, and waste substances filtered from the blood by the kidneys that passes out of the body via the urethra

Urine straining – process of pouring urine into a fine filter strainer to catch any particles, particularly kidney stones

Reproductive System

Cystocele – weakening of the wall between the urethra and the vagina causing the bladder to drop down into the vaginal canal

Prolapse – when a pelvic organ drops into the vaginal canal

Rectocele – occurs when the wall of tissue separating the rectum from the vagina weakens causing the rectum to shift downward into the vagina canal

Reproductive System – system that allows human beings to create a new human life and may be subdivided into two categories (1) the female reproductive system and (2) the male reproductive system

Uterine prolapse – when the pelvic floor muscles weaken resulting in the uterus shifting downward into the vaginal canal

Endocrine System

Diabetes Mellitus (DM, diabetes) – the most common disorder of the endocrine system and occurs when the pancreas produces too little insulin or does not use insulin properly causing sugar build up in the blood

Endocrine System – system of glands that secrete chemicals directly into the bloodstream to regulate body functions

Gestational diabetes – a type of diabetes that occurs during pregnancy

Glands – an organ that secretes chemicals, called hormones that regulate bodily function

Hyperglycemia – high blood sugar

Hypoglycemia – low blood sugar

Pancreas – organ of the body that produces insulin

Type 1 diabetes – a lifelong condition typically beginning during childhood and early adult when the pancreas does not produce insulin

Type 2 diabetes – a type of diabetes that develops after about age 35 when the pancreas secretes insulin, but does not use it well

Immune System

Acquired Immune Deficiency Syndrome (AIDS) – disease caused by a virus and attacks the immune system and destroys infection-fighting and cancer-fighting cells of the body

Graves' Disease – immune system attacks thyroid gland which causes it to secrete more thyroid hormone

Immune System – system defends threats both inside and outside the body

Lupus – when immune system attacks tissues causing redness, pain, swelling, and damage

Module H – Body Systems	
(S-1) Title Slide **(S-2, 3 & 4) Objectives** 1. Describe cell theory and the organization of the human body. 2. Identify the structure and function of the cell, variations of normal, and nurse aide's role when caring for someone with cancer. 3. Identify the structure and function of the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems. 4. Identify changes due to aging of the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems. 5. Compare and contrast normal findings and variation of normal findings and variation of the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems. 6. Describe common disorders of the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems. 7. Describe the nurse aide's role related to a resident's integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems.	
Content	**Notes**
ACTIVITY #H33 Pressure Injury Presentations – Class/Independent Project: In preparation for curriculum content on pressure injuries, early in the course, divide the class equally into teams so that the following concepts will be researched by and presented in class: 1. Introduction of topic including an overview, statistics, and the Centers for Medicare and Medicaid Services (CMS) 1. Define, describe, and demonstrate the following terms – pressure, bony prominence, shear, and friction, and their relationship to pressure injuries 2. Residents at risk 3. Stages of pressure injury 4. Pressure points 5. Prevention If class numbers do not allow for team assignments, then convert this activity to an individual project. Encourage creativity. [Ideas: for pressure points, take index cards and label pressure points on a mannequin or label them on an actual person; for stages of pressure injuries, create a model using plumber's putty and little bottles of paint in the crafts' section of your local store OR project images of stages from the internet.] It is up to the individual program as to how to assign a grade for this project, for example, as a stand-alone	

grade, part of the homework/quizzes grade, or a part of the participation grade.	
(S-5) Cell Theory – Structure and Function • Basic unit of all living tissues or organisms • All living organisms made of cells • Cellular function is essential process of living things • Cells have several functioning structures called organelles, that carry on work of cell • Are building blocks of the human body • Have same basic structure; function, size, and shape may differ • Need food, water, and oxygen to live and function • Microscopic in size • Divide, grow, and die, renewing tissues and organs • Reproduce for tissue growth and repair in an orderly manner • Combine to form tissue	
(S-6) Tissue – Structure and Function • Grouped together and carry out a particular function • Types — Epithelial – covers internal and external body surfaces; lines nose, mouth, respiratory tract, stomach, and intestines; skin, hair, nails, and glands — Connective – anchors, connects, and supports other tissues; located in every part of the body; bones, tendons, ligaments, and cartilage; blood is a form of connective tissue — Muscle – stretches and contracts to let body move — Nerve – receives and carries impulses to the brain • Combine to form organs	
(S-7) Organ – Structure and Function • Made of tissue, may be several types of tissues • Carries on a special function; examples are heart, stomach, bladder • Some are paired; examples are kidneys, lungs • Combine to form a system	
(S-8) System – Structure and Function • Made of groups of several organs functioning together for a specific purpose(s) • Combine to form an organism • Systems of the body include urinary, musculoskeletal, nervous, respiratory, cardiovascular, digestive, integumentary, endocrine, and reproductive	
(S-9) In Summary, Organization of the Body Cells, the basic unit of body structure; then tissue, then organ, then system	

(S-10) Organism – Structure and Function Made up of systems functioning together to perform activities of daily living that are needed for continued life	
(S-11) Cells – Normal Findings Reproduce for tissue growth and repair in a controlled and orderly manner	
(S-12) Cells – Variation of Normal Cell division and growth are out of control developing into a mass or clump of cells • Neoplasia (tumors) – growth of abnormal cells; may be benign or malignant — Benign tumors (non-cancerous) – do not spread to other body parts; may grow large, but nonlife-threatening; do not grow back when removed — Malignant tumors (cancerous) – invade and destroy nearby tissues; can also spread to other parts of body (metastasis) by breaking off and travelling; may be life-threatening; may grow back when removed; can occur almost anywhere in or on the body, but commonly occurs on skin and in the lung, colon, breast, prostate, uterus, ovary, bladder, and kidney	
(S-13) Cancer – Risk Factors (1) • Second largest cause of death; National Cancer Institute describes risk factors — Age – getting older most important risk factor — Tobacco – actual use (smoke, chew, dip) and second-hand (being around it) — Radiation – sunlight, X-rays, and radon gas — Infections – certain viruses and bacteria • Immuno-suppressive drugs – lower body's natural defense of stopping cancer from forming (organ transplant)	
(S-14) Cancer – Risk Factors (2) • Alcohol • Diet – high in fat, protein, calories, and red meat (colon and rectal); fruits and vegetables are great • Hormones – female hormones • Obesity • Environment – air pollution, second-hand smoke, and asbestos	
(S-15) Cancer – Seven Warning Signs • **C**hange in bowel or bladder habits • **A** sore that does not heal • **U**nusual bleeding or discharge from any body opening • **T**hickening or lump in breast or elsewhere • **I**ndigestion or difficulty swallowing	

• **O**bvious change in a wart or mole • **N**agging cough or hoarseness	
(S-16) Cancer – Treatment • Goals of cancer treatment are to cure (removal from body and kill cancer cells); to control (help resident live longer); and to reduce signs and symptoms from disease and treatment • Key is to find cancer early • Includes – surgery, radiation, chemotherapy, others (hormone, stem cell transplants, alternative) • Dependent on type, site, size, and if it has spread • May need one or several types of treatment • Can damage healthy cells and tissues nearby cancer • Side effects depend on type and extent of treatment	
(S-17) Cancer Treatment – Radiation • Kills cancer cells using X-ray beams aimed at the tumor or radioactive material implanted at or near the tumor • Side effects — At site – sore, irritated, redness, and blistering — Head and neck – dry mouth and sore throat — Tiredness — Discomfort, nausea, vomiting, diarrhea, and loss of appetite • Be aware of safety needs for health care providers and visitors; follow directives from care plan and the nurse • Nurse aide care directed at minimizing side effects and providing emotional support	
(S-18) Cancer Treatment – Chemotherapy (or Chemo) • Affects whole body; cancer cells and normal cells affected • Targeted therapy may be given that distinguish the difference between cancer cells and normal cells • May be given orally or intravenously, which may require a port (implanted device in a vein allowing for medications and/or IV fluids to be given and blood drawn) • Be aware of safety needs for health care providers and visitors, specifically handling body fluids; follow directives from care plan and the nurse	
(S-19) Cancer Treatment – Chemotherapy (or Chemo) • Side effects depend on drugs used — Hair loss (alopecia) — Digestive disturbances, such as poor appetite, nausea, vomiting, diarrhea, and loss of appetite — Stomatitis – inflammation of the mouth	

— Decreased blood cell production, resulting in potential for bleeding and infection, weakness, and tiredness — Changes in thinking and memory — Emotional changes • Targeting chemotherapy can also raise blood pressure • Nurse aide care directed at minimizing side effects and providing emotional support	
(S-20) Resident with Cancer – Nurse Aide's Role (1) • Resident's needs include: — pain relief or control — rest — exercise — fluids and nutrition — prevention of skin breakdown — prevention of bowel problems — dealing with side effects of treatment — psychologic needs — social needs — spiritual needs • Report to the nurse any of the following: — Increased weakness, fatigue, fainting — Nausea, vomiting, diarrhea — Change in appetite weight loss — Depression, confusion, change in mental state — Blood in mouth, urine, or bowel movement — Changes in skin, new lumps, sores, rash — Increase in pain or pain that is not relieved by medication	
(S-21) Resident with Cancer – Nurse Aide's Role (2) • Understand that each case is different; the residents you care for may live several months or many years; treatment effects each resident differently; never make assumptions about the resident or the resident's treatment • Social interaction – resident may want to talk or not; listen if resident wants to share their feelings or experiences; never push resident to express self; be honest, sensitive; be positive, comment if resident is eating more of diet or seems stronger • Proper nutrition – follow care plan; encourage a variety of foods with small portions if appetite is poor; for nausea or swallowing complaints, soups or gelatin may be tolerated; use plastic utensils if resident is receiving chemo (food tastes better) • Pain control – watch for signs and report to the nurse; provide comfort measures, such as repositioning and distraction	

• Assist with comfort and circulation – try a variety of positioning devices, assist to chair if care plan directs, reposition at least every 2 hours if weak or immobile • Skin care – watch for signs of pressure injury, keep skin clean and dry; never wash off markings; avoid applying lotion to radiation site; follow skin care directives on care plan • Mouth care – understand that chemo, nausea, vomiting, mouth infections can cause pain and bad taste in mouth; soft toothbrush, mouth care cleaning per care plan but avoid mouthwash with alcohol (can increase irritation); and gentle swabbing with oral swabs dipped in a rinse for mouth sores	
(S-22) The Resident with Cancer – Nurse Aide's Role • Self-image – may be an issue if weakened and has had change in appearance; hair loss common side effect, assist with grooming, show concern and interest • Visitors and family – if the visit is positive, do not intrude; check with the nurse about support groups in community if requested by visitors; watch for and report negative interactions to the nurse during visits	
#H22 Module H Alternative Classroom Instruction: **#H22** Decide whether Alternative Classroom Instruction exercise will be completed in place of traditional lecture for the following body systems, integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems. *All activities are still required if the alternative instructional method is chosen*. **Refer to Module H Teaching Guide- Appendix 1 Alternative Classroom Instruction at the end of this guide.** **If you choose to use the Alternative Classroom Instruction, then the instructor would STOP lecture at this point.**	
(S-23) Integumentary System – Overview • The skin • Largest organ and system in the body • Accessory structures include hair and nails • Responsible for providing a natural protective covering of the body	
(S-24) Integumentary System – Structure • Three layers — Epidermis – the outer layer has living and dead cells; living cells push dead cells up as they divide, and dead cells flake off; living cells contain pigment that	

give the skin its color; does not have blood vessels and only few nerve cells – Dermis – inner layer is made up of connective tissue; blood vessels, nerves, sweat glands, oil glands, and hair roots located there – Subcutaneous (fatty) tissue – thick layer of fat and connective tissue	
(S-25) Integumentary System – Function • Protects body from injury and pathogens • Regulates body temperature • Eliminates waste through perspiration • Contains nerve endings for cold, heat, pain, pressure, and pleasure • Stores fat and vitamins	
(S-26) Integumentary System – Normal Findings • Warm, dry • Absence of breaks, rash, discoloration, swelling	
(S-27) Integumentary System – Changes Due to Aging • Skin is thinner, drier, more fragile • Skin loses elasticity • Fatty layer decreases so person feels colder • Hair thins and may gray	
(S-28) Integumentary System – Changes Due to Aging • Folds, lines, wrinkles, and brown spots may appear • Nails harden and become more brittle • Reduced circulation to skin, leading to dryness and itching • Development of skin tags, warts, and moles	
(S-29) Integumentary System – Variation of Normal • Breaks in skin • Pale, white, or reddened areas • Black and blue areas • Changes in scalp or hair • Rash, itching or skin discoloration • Abnormal temperature	
(S-30) Integumentary System – Variation of Normal • Ulcers, sores, or lesions • Swelling • Dry or flaking skin • Fluid or bloody drainage	
(S-31) Shingles (Herpes Zoster) • Caused by a virus; same virus that causes chicken pox. The virus is inactive in nerve tissue and can become	

active years later. This is most common in people over 50 • Signs – rash or blisters on one side of body, burning pain, numbness, and itching; lasts about 3 to 5 weeks. Centers for Disease Control (CDC) states that the following should avoid contact with infected resident: never had chicken pox or immunization, have a weakened immune system, pregnant and never had chicken pox or immunization • Infectious until lesions are crusty • Nurse aide's role – per directive of care plan, keep rash covered until crusty, remind resident to wash hands often and avoid scratching or touching rash. Vaccine recommended for people 60 years or older who have had chicken pox	
(S-32) Stasis Dermatitis • Skin condition affecting lower legs and ankles • Occurs from buildup of fluid under skin • Problems with circulation resulting in fragile skin • Can lead to open ulcers and wounds • Early signs – scaly, red, itchy areas; later signs – swelling of legs, ankles, or other areas; thin skin; darkening skin, leg pain • Nurse aide's role – report signs; note too tight stockings and shoes and report to the nurse; follow directives of care plan which may include anti-embolism stockings and elevation of feet	
TEACHING TIP #H33 Evolution of the Pressure Injury: Tell students that the term used for pressure injury has evolved through time: bedsore, pressure sore, decubitus ulcer, pressure ulcer, and now, the pressure injury.	
ACTIVITY #H33 Pressure Injury Presentations – Class Project: This will be an excellent point in the curriculum for student teams to complete their Pressure Injury Projects by presenting to the class. You may add content that was omitted right after each part or at the end of the presentations.	
(S-33) The Pressure Injury • The Centers for Medicare and Medicaid Services (CMS) defines the pressure ulcer (injury) as "any lesion caused by unrelieved pressure that results in damage to underlying tissues; friction and shear are factors" • CMS requires that long-term care facilities identify residents at risk for pressure ulcers • Many pressure injuries occur within the first four weeks of admission to the facility	

(S-34) Bony Prominences An area where bone sticks out or projects from flat surface of the body: back of head, shoulder blades, elbows, hips, spine, sacrum, knees, ankles, heels, and toes	
(S-35) Pressure Injury – Key Terms • Shear – when layers of skin rub up against each other; or it could be when skin remains in place, but tissues underneath move and stretch causing damage to capillaries and blood vessels • Friction – rubbing of one surface against another; skin is dragged across a surface • CMS has defined two other terms — Unavoidable pressure injury – a pressure injury occurs despite efforts to prevent one through best practices — Avoidable pressure injury – one that develops from improper use of the best practices	
(S-36) Pressure Injury – At Risk Factors • Pressure is major cause of pressure injuries; shearing and friction are contributing factors; all contribute to skin breakdown • Risk factors – immobility, breaks in skin, poor circulation to area, moisture, dry skin, and urine and feces irritation • Older residents and disabled residents are at risk due to skin changes due to age, chronic disease, and frailty	
(S-37) Pressure Injury – Residents at Risk • Bedfast (confined to bed) residents • Requires some or total help moving (coma, paralysis, hip fracture) • Agitated or have involuntary muscle movement • Urinary or fecal incontinence • Exposed to moisture • Poor nutrition; poor fluid balance • Lowered mental awareness • Problems sensing pain or pressure • Have circulatory problems • Are older • Are obese or very thin • Refuse care • History of pressure injuries	
ACTIVITY #H38 Pressure Injury Staging Illustrations: A picture is worth a thousand words and that is true for the stages of pressure injury development. Locate images of these stages using your favorite search engine and project during instruction.	

You may want to include additional images separate and apart from those that the students who are assigned to that section of Activity #H33 have located.	
(S-38) Pressure Injury Stages • Stage 1 – intact skin; redness over bony prominence • Stage 2 – Skin loss (partial-thickness); may see a blister or shallow reddish-pink ulcer; the blister may be intact or open • Stage 3 – Skin loss (full-thickness); skin gone; may see subcutaneous fat; slough (dead soft tissue, often moist and varies in color – white, yellow, green, or tan) may be present; could be attached or stringy loose • Stage 4 – Full-thickness skin and tissue loss with muscle, tendon, and bone exposure; slough and eschar (thick, leathery dead tissue that may be loose or attached to skin); often black or brown • Unstageable – Full-thickness tissue loss with injury covered by slough and/or eschar (dead tissue) • Deep tissue injury – purple or deep red localized area of discolored intact skin or blood-filled blister; usually due to damage of underlying soft tissue from pressure and/or shear	
(S-39) Pressure Injury – Pressure Points Occur over bony areas and the sacrum being the most common site	
(S-40) Pressure Injury - Sites • Objects can contribute to pressure injury – eye glasses, oxygen tubing, tubes, casts, braces • Pressure areas can occur where skin is in contact with skin, such as abdominal folds, legs, buttocks, thighs, and under breasts	
(S-41) Pressure Injury- Prevention is Key • Identify residents at risk • Measures directed at – handling, moving, and positioning of the resident – providing skin care	
(S-42) Handling, Moving, and Positioning of Resident • Refer to care plan for directives • Follow repositioning schedule • Use assistive devices (pillows and foam wedges) • Support feet properly • Do not position on red area, pressure injury, on tubes or other medical devices • Prevent bed friction (powdered sheets are an example) • Prevent shearing (do not raise the head more than 30^{o}) • Keep feet and heels off bed	

(S-43) The 30º Lateral Position • Bed is not raised more than 30º • Pillows are placed under head, shoulder, and leg • Position lifts the hip to avoid pressure on the hip at about a 30º angle • Person does not lie on hip when in side-lying position	
(S-44) Providing Skin Care to Prevent Pressure Injury • Inspect skin every time care is provided • Follow care plan for bathing schedule; do not use hot water; use cleansing agent (soap can dry and irritate skin) • Prevent incontinence • Check for perspiration or wound drainage • Apply moisturizer to dry areas • Give a back rub when repositioning; do not rub over boney prominences • Keep linen clean, dry, and free of wrinkles • Avoid scrubbing vigorously when bathing or drying • Avoid skin-to-skin contact by using pillow or blanket placement • No heat directly on pressure injury	
(S-45) Musculoskeletal System – Overview • Provides structure and movement for the body • Protects and gives the body shape • Body has over 600 muscles made up of elastic tissue • Some are connected to bones by tendons	
(S-46) Muscles – Structure May be involuntary (cardiac or smooth) or voluntary (skeletal) • Involuntary – work automatically; cannot control — Cardiac – in the heart; striated — Smooth – control action of organs, such as stomach, intestines, blood vessels, and others; smooth • Voluntary – can be controlled — Skeletal – attached to the skeleton; include the arm and the legs; striated	
(S-47) Muscles – Function • Power movement of the skeleton – tendons that connect muscles to bone and move bones when muscles contract (shorten) • Give body form and posture • Produce most of body heat – when muscles contract, food is burned for energy producing heat; more muscle activity, greater amount of heat; when body is cold, rapid	

muscle contractions occur producing heat, called shivering	
(S-48) Skeletal (Bones) – Structure • The skeleton — 206 bones — Framework • Bones — Outside is hard and rigid — Covered with periosteum, which contains blood vessels — Bone marrow, located inside, is soft and spongy — Connected to other bones by ligaments — Connected to muscles by tendons	
(S-49) Skeleton (Bones) – Function • The skeleton — Provides framework for body — Protects organs of the body • Bones — Allows body to move — Stores calcium — Make and store blood cells in bone marrow	
TEACHING TIP #H49 Model Skeleton: Use a model skeleton to show how bones support the body and protect the organs.	
(S-50) Joints – Structure • Point where bones meet • Made up of connective tissue called cartilage that cushions bones; keeps them from rubbing together • Synovial membrane lines joints and secretes synovial fluid that acts as lubricant, so joints move smoothly • May be movable (ankle), slightly movable (backbone), or immovable (skull) • Ligaments located here hold bones together • Types – ball-and-socket, hinge, and pivot	
(S-51) Types of Joints – Function • Ball-and-socket – allows movement in all directions; made up of rounded end of one bone fitted into the hollow end of another bone; examples – hips and shoulders • Hinge – allows movement in one direction: examples – elbows and knees • Pivot – allows turning from side to side; example – skull connected to spine	
(S-52) Musculoskeletal System – Normal Findings	

• Ability to perform routine movements and activities of daily living • Ability to perform full range of motion exercises bilaterally without pain	
TEACHING TIP #H52 Musculoskeletal Movement: Following along with the next slides, demonstrate and have the students stand and perform each movement: • Abduction and adduction • Extension and flexion • Pronation and supination • Dorsiflexion and plantar flexion • Opposition	
(S-53) Musculoskeletal System – Normal Findings • Abduction bilaterally without pain	
(S-54) Musculoskeletal System – Normal Findings • Adduction bilaterally without pain	
(S-55) Musculoskeletal System – Normal Findings • Extension of arm bilaterally without pain	
(S-56) Musculoskeletal System – Normal Findings • Flexion of arm bilaterally without pain	
(S-57) Musculoskeletal System – Normal Findings • Extension of leg bilaterally without pain	
(S-58) Musculoskeletal System – Normal Findings • Flexion of leg bilaterally without pain	
(S-59) Musculoskeletal System – Normal Findings • Pronation	
(S-60) Musculoskeletal System – Normal Findings • Supination	
(S-61) Musculoskeletal System – Normal Findings • Dorsiflexion	
(S-62) Musculoskeletal System – Normal Findings • Plantar flexion	
(S-63) Musculoskeletal System – Normal Findings • Opposition	
(S-64) Musculoskeletal System–Changes Due to Aging (1) • Muscles weaken and lose tone • Bones lose density and become brittle • Slower muscle and nerve interaction • Joints stiffen, become less flexible, and become painful causing decrease in range of motion and flexibility	

(S-65) Musculoskeletal System–Changes Due to Aging (2) • Height decreases 1 to 2 inches, between age 20 and 70 • Slowed recovery from position changes and sudden movement • Pain when moving • Reaction time, movement speed, agility, and endurance decrease • Poorer response to stimuli	
(S-66) Musculoskeletal System – Variation of Normal • History of falls • Difficulty with holding or lifting objects • Loss of muscle strength and tone • Generalized weakness and tiredness • Bruising • Slow and unsteady body movement • White, shiny, red, or warm areas over a joint • Complaints of pain in joints or muscles • Swelling, redness, and warmth of joints • Complaints of pain with movement • Inability to move joints	
(S-67) Arthritis Inflammation or swelling of the joints; causes stiffness, pain, and decreased mobility; two common types: • Osteoarthritis (degenerative joint disease); affects the elderly and may occur with aging or joint injury; usually weight-bearing hips and knees involved, but may also include fingers, thumbs, and spine; pain and stiffness typically increase with damp, cold weather • Rheumatoid arthritis – affects any age; starting with smaller joints then progressing to larger ones; joints become red, swollen, and very painful, fever, tiredness, and weight loss occur; severe and painful deformities can result with eventual movement restricted; considered an autoimmune disease when normal tissue is attacked by the immune system	
(S-68) Arthritis – Nurse Aide's Role • Encourage activity, follow care plan, canes, and safety rails are helpful. • Encourage independence by assisting with the use of devices that help with bathing, dressing, and feeding; offer clothing choices that are easy to put on and fasten; treat each resident individually. • Help maintain self-esteem by encouraging self-care as much as possible, listen • Watch for and report stomach upset and heartburn, due to medicine	

(S-69) Osteoporosis • Bones lose density causing them to become porous and brittle; bones break easily • Caused by lack of calcium in diet, lack of regular exercise, decrease in mobility, decrease in female hormones • Signs – low back pain, stooped posture, becoming shorter, and broken bones • Nurse aide's role — Prevent or slow the progression — Encourage walking and simple exercise per care plan or the nurse's directive — Move resident carefully	
(S-70) Fracture • Broken bone caused by an accident or osteoporosis • Closed (does not break the skin) or open (also called compound and breaks through the skin). • Most common – fractures of arms, wrists, elbows, legs, and hips • Goal is to put bone back in alignment, so it can heal; bone tissue grows and fuses area together, but must be allowed to do so by not moving area by typical use of a cast or brace • Signs – pain, swelling, bruising, limited mobility • Nurse aide's role — Prevention in falls is crucial — Follow fall prevention concepts — If casted or braced, elevate arm or leg slightly higher than level of heart — Observe circulation of fingers or toes (warmth, color, movement of fingers or toes) — Report swelling, tightness of cast or brace, sores, cool fingers or toes, drainage, or bleeding — Report irritation from edges of cast or brace — Keep cast or brace dry and assist with personal care per directive of care plan or the nurse — Monitor and report if resident sticks objects in the cast or brace	
(S-71) Hip Fracture • A break in the hip bone is a serious condition requiring months of recovery • Older resident heals slowly, and complications may occur such as secondary illnesses and disability • Most require surgery and total hip replacement • Focus of care includes healing of incision, slow strengthening of muscles of the hip region and increased mobility, gait, and endurance • Nurse aide's role	

— Prevention in falls is crucial — Follow fall prevention concepts — After surgery and during rehabilitation, follow care plan carefully as it will provide guidance on weight bearing limitation — Monitor how much resident can do, and which assistive devices may be used — Follow directives about weight-bearing limitations (how much weight the resident can support – non, partial, or full) — Do not perform range of motion until directed to do so — Know the limitations of leg and hip movements, use abduction pillow (special foam pillow placed in between legs that immobilizes and positions hips and legs using straps) as directed by care plan and the nurse — Report the following to the nurse o Incision redness o Drainage o Bleeding o Increased pain o Numbness or tingling of feet and legs o Tenderness or swelling in calves of legs o Shortening or rotation outward of affected leg o Abnormal vital signs o Resident is being non-compliant with limitations o Decrease in appetite o Improvements that are noted	
(S-72) Total Knee Replacement (TKR) • Surgical replacement of knee with a prosthesis • Prosthesis is a device that replaces body part that is missing or deformed • Performed to relieve pain and restore mobility, damaged by arthritis or injury • Post-op care is similar to hip replacement; resident does have greater ability to do self-care though • Goals – prevent blood clots by using special stockings and machines; speed up recovery, decrease stiffness, and increase range of motion • Nurse aide's role — Follow care plan and the nurse's directive regarding mobility — Encourage fluids to reduce urinary infections — Report pain and redness, swelling, heat, or tenderness in calves	
(S-73) Amputation • Surgical removal of body part; for example, arm, hand, leg, foot that is caused by disease or accident	

• Phantom sensation and pain – person feels the body part is still there and experiences pain in the area that has been amputated — Do not ignore — Possibly results from damaged nerve endings — Report to the nurse • Nurse aide's role — Per care plan and the nurse directive, provide assistance with activities of daily living — Provide support if phantom statements are made and do not argue with resident — Report to the nurse — Assist with position changes and range of motion exercises per directive — Follow care plan regarding prosthetic care	
(S-74) Contracture and Muscle Atrophy • Contracture – the muscle or tendon shortens, freezes, becomes inflexible; causes permanent disability • Muscle atrophy – the muscle wastes away, decreases in size, and becomes weak, from disuse • Prevention of these two conditions is critical • Perform range of motion exercises • Use positioning and supportive devices to maintain structure and function of extremities	
(S-75) Nervous System – Overview • Control and coordinate all body functions • Reflex centers for heartbeat and respiration • Senses and interprets information from outside the body and responds to needed changes both inside and outside the body	
(S-76) Nervous System • Consists of two main divisions — Central nervous system (CNS) – brain and spinal cord — Peripheral nervous system – includes nerves that travel throughout the body	
(S-77) The Neuron (Nerve Cell) • Neuron is basic unit of the nervous system • Carry messages or impulses through spinal cord to and from the brain — Fragile and takes a long time to heal if injured — Some are covered and insulated with a protective fiber, called the myelin sheath; also allows for speed of conduction of impulses	
(S-78) The Brain- Structure and Function • 3 Parts	

— Cerebrum — Cerebellum — Brainstem • Protected by the skull	
(S-79) Brain – The Cerebrum • Divided into right and left hemispheres — Right hemisphere controls movement and function of left side — Left hemisphere controls movement and function of right side — Any illness or injury to right hemisphere affects function of left side — Any illness or injury to left hemisphere affects function of right side • Cerebral cortex – outer layer; ideas, thinking, analysis, judgment, emotions, memory occurs, guides speech, interprets messages from senses, controls voluntary muscle movement	
(S-80) Brain – The Cerebrum • Each side of your brain contains four lobes. — The frontal lobe is important for cognitive functions and control of voluntary movement or activity — The parietal lobe processes information about temperature, taste, touch, and movement — The occipital lobe is primarily responsible for vision — The temporal lobe processes memories, integrating them with sensations of taste, sound, sight, and touch	
TEACHING TIP #H80 Right and Left-Brain Dominance: The students may be interested in talking about Right-Brain and Left-Brain Dominance. Locate a quiz the students may take in class or at home to determine their own dominance.	
(S-81) The Brain – Brain Stem and Cerebellum • Brain Stem — Regulatory center — Controls heart rate, breathing, swallowing, opening/closing blood vessels • Cerebellum — Controls balance and regulates voluntary muscles — Produces and coordinates smooth movements	
(S-82) Spinal Cord and Sensory Organs • Spinal cord — Located within the spine — Connected to the brain — Conducts messages between the brain and the body by pathways • Sensory Organs	

— Include skin, tongue, nose, eyes, and ears — Receives impulses from environment and relays impulses to brain	
(S-83) Nervous System– Normal Findings • Alert and oriented, with clear short-term/long-term memory • Sensory function intact • Ability to sense heat, cold, pain • Straight gait; coordination of limbs • Reflexes present	
(S-84) Nervous System – Changes Due to Aging • Some hearing loss occurs • Appetite decreases • Less tear production • Vision decreases • Problems seeing blue and green • Pupils less responsive to light • Changes in memory, most likely with short-term memory	
(S-85) Nervous System – Changes Due to Aging • Loss of nerve/brain cells • Slowed response and reflex time • Jerking motions or tremors • Reduced sense of touch and sensitivity to pain • Reduced blood flow to the brain • Forgetfulness • Each of the senses decrease in function • Sensitivity to heat and cold decreases	
(S-86) Nervous System – Variation of Normal • Changes in gait or movement • Complaint of loss of feeling or inability to move one side of the body • Paralysis • Seizures • Confusion • Speech, vision, or hearing changes • Complaints of numbness, dizziness, nausea	
(S-87) Stroke-Cerebrovascular Accident (CVA) • Caused when a blood vessel leaks or breaks in the brain or when oxygen to an area is disrupted, causing brain cells to die • Can be mild or severe • EMERGENCY	
(S-88) Stroke-Cerebrovascular Accident (CVA)	

• Recall that cerebrum is divided into right and left hemispheres; right controls movement and function of left side; left controls movement and function of right side; illness or injury to right hemisphere affects function of left side; illness or injury to left hemisphere affects function of right side • Further recall that each side of your brain contains four lobes with important functions • The area of the brain and the size of the area affected by the injury will impact the severity of the stroke, signs, and symptoms the resident will exhibit, extent of disability, and prognosis • F.A.S.T. — F - Facial Drooping — A - Arm weakness — S - Speech Difficulty — T - Time to call the nurse/911 • Other symptoms- numbness, confusion, trouble seeing and/or walking, and severe headache	
(S-89) Stroke-Cerebrovascular Accident (CVA)-After the stroke, the resident may experience: • Hemiplegia – paralysis on one side of body • Hemiparesis – weakness on one side of body • Expressive aphasia – trouble communicating thoughts by speech or writing • Receptive aphasia – difficulty understanding spoken or written words • Emotional lability – inappropriate or uncalled for laughing, crying, or expressions of anger • Loss of sensations (temperature, touch) • Loss of bowel/bladder control • Cognitive impairment (poor judgment, memory loss, inability to solve problems, confusion) • Dysphagia (difficulty swallowing)	
(S-90) Stroke – Nurse Aide's Role • Will vary depending on severity of stroke and region of the brain involved • In general, to assist the resident to strengthen muscles and keep joints mobile, — provide range of motion — maintain correct body alignment and support extremities with pillows and other measures — maintain positive attitude when using non-verbal and verbal communication — never refer to the weak side as the "bad leg or bad arm" — assist with communication using techniques recommended by speech therapist or the nurse	

• Understand that confusion and/or memory loss can be frightening and frustrating to the resident, may cry for no reason • When caring for resident, smiles and simple gestures may be helpful to decrease fear or anger • Encourage independence and self-esteem by letting resident do as much care whenever possible, celebrate small victories, and make tasks as easy as possible • Be very observant for changes in skin condition especially those areas at risk for pressure injury development • May be at increased risk for pressure injury if loss of sensation is present or resident cannot move a side of the body, and report changes immediately to the nurse • Be aware of bath water temperature and shaving if the resident has loss of touch or sensation • Adapt self-care activities to limitations of the resident's condition by having them use assistive devices for eating and dressing • Remember to put items the resident will need such as their call signal, water pitcher, and glasses on the resident's unaffected side	
(S-91) Parkinson's Disease • Progressive incurable disease that causes a part of the brain to degenerate • Signs and Symptoms — Muscles to stiffen — Gait shuffling — Bent posture — Pin-rolling with finger and thumb — Tremors — Shaking — Mask-like facial expression • Nurse aide's role — Protect resident — Keep out of unsafe areas — Assist with ambulation because resident is at high risk for falls and running into things due to changes in mobility and visual impairments — Assist with activities of daily living self-care	
(S-92) Head and Spinal Cord Injuries (1) • May result from diving accidents, sports injuries, motor vehicle accidents, and war injuries • Injuries range from mild concussion to coma, paralysis, and death	
(S-93) Head and Spinal Cord Injuries (2) • Head injuries may cause permanent brain damage	

• Disabilities are related to the part of brain injured and may include personality changes, seizures, memory loss, paresis (loss of use of muscle function affecting only part of body), and full-blown paralysis • Severity of spinal cord injuries depend on the level and force of injury to spinal cord, and the higher the injury to the spinal cord, the greater loss of function • Paraplegia – complete loss of function occurs to lower body • Quadriplegia – complete loss of function occurs to lower and upper body, plus trunk • Nurse aide's role — Provide emotional support and realize that the resident may exhibit feelings of anger and frustration — Encourage resident to participate as much as possible in self-care — Crucial for position changes at a minimum of every two hours due to loss of function — Range of motion per directives of care plan — Immobility may lead to constipation, so encourage fluids and intake of fiber, if ordered — Due to nature of disability, urinary catheter may be necessary, which increases occurrence of urinary tract infection, so provide catheter care and encourage fluids — Immobility may lead to poor circulation — Offer rest periods during care — Apply stockings per directive — Encourage deep breathing and coughing, per order, to prevent pneumonia	
(S-94) Cardiovascular System– Overview • Also called the circulatory system • The continuous movement of blood through the body	
(S-95) Cardiovascular System – Changes Due to Aging • Heart muscle less efficient • Blood pumps with less force • Arteries lose elasticity and become narrow • Blood pressure increases	
(S-96) Cardiovascular System – Variation of Normal (1) • Shortness of breath, changes in or difficulty breathing • Change in pulse rate and rhythm • Loss of ability to perform ADLs • Chest pain	
(S-97) Cardiovascular System– Variation of Normal (2) • Bradycardia- less than 60 beats per minute • Tachycardia- more than 100 beats per minute	

• Irregular pulse rhythm • Swelling of hands and feet • Pale or bluish lips, hands, or feet • Weakness and tiredness • Weight gain	
(S-98) Hypertension (High Blood Pressure) • Major cause is atherosclerosis, or what lay people refer to as “hardening of the arteries” • Arteries harden due to plaque build-up from fatty deposits • May complain of headache, blurred vision, and dizziness	
(S-99) Abnormal Blood Pressure Ranges Refer to American Heart Association, https://www.heart.org/en/health-topics/high-blood-pressure/understanding-blood-pressure-readings for further details and graphics • Elevated blood pressure — Systolic – 120 mm Hg to 129 mm Hg AND — Diastolic – less than 80 mm Hg • Hypertension — Systolic – 130 mm Hg or higher OR — Diastolic – 80 mm Hg or higher • Hypotension — Systolic – less than 90 mm Hg — Diastolic – less than 60 mm Hg	
(S-100) Orthostatic Hypotension • Abnormal low blood pressure that occurs when the resident suddenly stands up; complains of feeling weak, dizzy, faint, and seeing spots before the eyes • May be a complication from being on bed rest	
(S-101) Orthostatic Hypotension – Prevention • Per care plan and directive from the nurse — Increase activity in stages: bed rest then sitting on side of bed (dangling) then walking — Before standing, while sitting on side of bed (dangling), have resident cough/deep breathe and move legs back-and-forth in circles, 1 to 5 minutes — Ask resident to report weakness, dizziness, faintness, or seeing spots — May need 2 (two) people to assist resident with activity	
(S-102) Coronary Artery Disease (CAD) • A condition in which blood vessels in the coronary arteries narrow, lowering blood supply to the heart and depriving it of oxygen	

• Over time, fatty deposits block arteries, which may result in a myocardial infarction (MI or heart attack) • If artery is blocked in brain, a stroke results	
(S-103) Angina Pectoris (Angina) • Occurs when heart muscle is not getting enough oxygen • Causes chest pain, pressure or tightness of chest, pain radiating up the jaw, and/or down the left arm, may perspire and become short of breath • Exercise, stress, excitement, or digesting a big meal requires additional oxygen; with coronary artery disease, the narrowed blood vessels keep heart muscle from getting enough oxygen	
(S-104) Myocardial Infarction (MI) - Heart Attack • An emergency situation when all or part of the blood flow to the heart muscle is blocked and oxygen and nutrients cannot reach cells in the area • Waste products are not removed; muscle cells in the area die • Area may be small or large, depending on which artery is involved • If resident survives, cardiac rehabilitation is ordered	
(S-105) Peripheral Vascular Disease (PVD) • Poor circulation of legs, feet, arms, hands due to fatty deposits that harden in blood vessels • Signs and symptoms – nail beds and feet pale or blue, swelling in hands and feet, ulcers of legs and feet, pain while walking • Follow care plane directive regarding elastic stockings	
(S-106) Congestive Heart Failure (CHF) • When one or both sides of the heart stops pumping blood effectively • Can cause severe damage to the heart muscle • Left side damage causes blood to back up into lungs; right side damage causes blood to back up into legs, feet, or abdomen • Signs and symptoms – tiredness, weakness, dizziness, rapid or irregular heartbeat, shortness of breath, edema (swelling of feet and ankles), increased urination at night, weight gain • Nurse aide's role — Assist to bathroom — Respond to call signal promptly — Allow rest periods — Monitor intake and output — Apply elastic stockings per order — Provide extra pillows	

— Keep HOB elevated — Weigh resident — Provide range of motion	
(S-107) Edema • When fluid intake is greater than fluid output, edema occurs • Body tissues swell with water • May occur from heart or kidney disease • Nurse aide's role includes — Obtain accurate weights per order — Restrict fluids per doctor's order — Measure and record I&O accurately, if ordered — Increase pillows per resident's request • Notify the nurse if — Weight gain of 1 to 2 pounds in a day — Decrease in urine output — Increased heart rate — Difficult breathing or shortness of breath — Coughing — Fatigue — Swelling of ankles, feet, fingers, and/or hands — Tight, smooth, shiny skin	
(S-108) Cardiovascular System – Nurse Aide's Role • Per directive of care plan or the nurse, monitor vital signs (BP and P) and report abnormal values • Assist with special diet needs (low fat, low sodium) • Measure intake and output if resident receives special medication • Provide rest periods at intervals; rest reduces need for extra oxygen • Prevent resident from tiring • Layer clothing to help with warmth • Report complaints of chest pain immediately to the nurse; stay with resident and use call signal for assistance • Avoid extremes in temperature, particularly a cold room • Reduce stressful situations; be aware of interactions between resident and visitors; notify the nurse if resident becomes upset	
(S-109) Respiratory System – Structure and Function • Thorax – Closed cavity of the body that contains the structures needed for respiration – Extends from the base of the neck to the diaphragm, and surrounded by muscles and ribs • Upper Respiratory Tract	

– Consists of nose, mouth, sinuses, pharynx, larynx, and top of trachea • Lower Respiratory Tract – Consists of lower trachea, bronchi, and lungs • Function – involves the breathing in of oxygen (inspiration) and the breathing out of carbon dioxide (expiration)	
(S-110) Respiratory System – Changes Due to Aging • Respiratory muscles weaken • Lung tissue gradually becomes less elastic • Shortness of breath upon exertion • Lung capacity decreases • Oxygen in the blood decreases • Muscles of the diaphragm become weaker • Limited expansion of the chest due to changes in posture	
(S-111) Respiratory System – Variation of Normal • Shallow breathing or breathing through pursed lips • Coughing or wheezing • Nasal congestion or discharge, or productive cough • Noisy respirations • Gasping for breaths • Too slow or too fast respiratory rate • Hypoventilation or hyperventilation • Need to sit after mild exertion • Mild pain in the chest	
(S-112) Respiratory System – Key Terms • Dyspnea – difficulty breathing • Bradypnea – less than 12 breaths/minute • Tachypnea – more than 20 breaths/minute • Apnea – 0 (zero) breaths • Cheyne-Stokes- alternating periods of slow, irregular breathing and rapid, shallow breathing, plus short periods of absent breathing • Cyanosis – changes in skin color, pale or bluish color of lips and extremities	
(S-113) Chronic Obstructive Pulmonary Disease (COPD) • Chronic progressive disease causing trouble breathing and difficulty forcing air out of lungs; include chronic bronchitis and emphysema • Chronic bronchitis – irritation and inflammation of bronchi usually caused by smoking; signs – productive cough that brings up sputum (phlegm) and mucus, breathlessness, and wheezing • Emphysema – chronic disease of lungs usually results from chronic bronchitis and smoking; signs – problems	

breathing, coughing, breathlessness, and rapid heartbeat; no cure and irreversible; is usually on oxygen	
(S-114) COPD • When lungs do not get enough oxygen, all body systems affected • Resident with chronic lung disease may live in constant fear of not being able to breathe causing them to sit upright in attempt to improve lung expansion • Resident may have poor appetite • Resident may not sleep well, leading to further weakness and poor health • Resident may feel out of control and fear suffocation	
(S-115) Lung of Smoker With COPD • COPD signs and symptoms — Chronic cough — Wheezing — Difficulty breathing — Shortness of breath during exertion — Pale, cyanotic, or reddish-purple skin — Confusion — Weakness — Difficulty in finishing meal because of shortness of breath — Fear — Anxiety	
(S-116) COPD – Nurse Aide's Role • Help sit up or forward leaning supported with pillows • Offer fluids and small, frequent meals • Encourage pursed-lip breathing taught by the nurse – inhaling slowly through nose and exhaling slowly through pursed lips (as if about to whistle) • Observe oxygen in use (NEVER adjust) • Be supportive of fears, carefully • Follow infection prevention principles during care • Encourage rest period	
TEACHING TIP #H117 Pursed-Lip Breathing: Consider showing one or both of the following videos in class: *Pursed-Lip Breathing, by the American Lung Association* **https://www.youtube.com/watch?v=7kpJ0QlRss4** *Top 3 Breathing Ex. for COPD -Chronic Obstructive Pulmonary Disease* **https://www.youtube.com/watch?v=oa5Sn-R8FCg** *COPD Breathing Exercise: Pursed Lip Breathing*	

https://youtu.be/2utkaRhutJY?si=iaDuZ_b7wxzfJS7c	
(S-117) COPD Resident What to Report to the Nurse • Signs/symptoms of colds or illness, which makes COPD worse • Changes in breathing and changes in lung secretions • Changes in mental state • Excessive weight gain • Increasing dependency on staff and family	
(S-118) Pneumonia • Acute infection of tissue of lung or lungs that may be caused by bacteria, virus, or fungus • Signs and symptoms– high fever, chills, cough, greenish or yellow sputum, chest pains, and rapid pulse • Resident with COPD at greater risk for developing pneumonia due to weakened immune system and recovery is longer for older residents and residents with COPD	
(S-119) A Person with Asthma • Picture of healthy (blue) and unhealthy (red) bronchial tubes of a resident having an asthma attack • Unhealthy (red) one results in a constricted breathing problem	
(S-120) Asthma • Chronic inflammatory disease occurs when respiratory system is hyperreactive (reacts quickly and strongly) to irritants, such as pollen and dust • Exercise and stress can worsen • When bronchi become irritated from the irritants, they constrict, making it difficult to breathe • In response to irritation and inflammation, mucus membranes produce thick mucus; further inhibiting breathing because air gets trapped in lungs causing coughing and wheezing • Residents with asthma should avoid triggers (irritants)	
(S-121) Upper Respiratory Infection (URI) or Cold • Viral infection of nostrils, nasal cavity, sinuses, and throat. Can lead to bacterial infection. • Signs – nasal drainage, sneezing, sore throat, fever, and tiredness • Remedy – body's immune system, fluids, and rest; stay away from smoke; may be more comfortable sitting up; stay away from residents with COPD	
(S-122) Respiratory System – Nurse Aide's Role • Provide rest periods at intervals • Encourage exercise and regular movement	

• Assist with deep breathing exercises • Limit exposure to smoke, polluted air, or noxious odors by residents with respiratory conditions • Position residents in a manner to maximize lung expansion	
TEACHING TIP #H122 Position and Breathing: Have students take a couple of deep breaths while seated in their chairs and then have them stand up, bend over, and then take a couple more deep breaths. Ask students: Which position was easier to take a deep breath? Explain the importance of positioning residents in bed in a manner to facilitate lung expansion.	
(S-123) Digestive – Overview • Known as the gastrointestinal (GI) system • Extends from the mouth to the anus • Has 2 functions: digestion and elimination	
(S-124) Digestive System – Structure and Function • Upper GI structures include the mouth, pharynx, esophagus, and stomach • Lower GI structures include the small intestines and large intestines • Accessory organs include the teeth, tongue, salivary glands, liver, gall bladder, and pancreas • GI System digests food, absorbs nutrients, and eliminates waste	
(S-125) Peristalsis • Involuntary contractions that move food through the digestive system	
ACTIVITY #H126 Simulated Small Intestines: Unwind the small intestines (23-foot rope/cord) and stretch it out with the assistance of a couple of students. Inform the students that the average length of the small intestines is 23 feet, and the average diameter is about an inch. **ACTIVITY #H126-1 Simulated Large Intestines:** Unwind the large intestines (5-foot rope/cord) and stretch it out with the assistance of a couple of students. Inform the students that the average length of the large intestines is 5 feet, and the average diameter is about 3 inches. Talk about the importance of diet, fluids, positioning during elimination, and activity in relation to the length of intestines.	
(S-126) Bowel Movement	

• Bowel movement may be referred to as feces, stool or simply, BM • The passage is called defecation or bowel elimination and involves the movement of the feces from the large intestines out of the body through the anus • Semi-solid material made of water, solid waste, bacteria, and mucus • Number of bowel movements a person has dependent upon age and what the person has eaten • Iron supplements can cause a dark black color; red food coloring, beets, and tomato juice can cause a red color • Descriptors — Diarrhea – liquid stool — Constipation – inability to have a stool or infrequent, difficult, and possibly painful elimination of a hard, dry stool — Flatulence – gas — Incontinence of stool – not able to control bowels, leading to an unintentional, spontaneous passage of stool	
(S-127) Digestive System– Normal Findings • Adequate intake of a well-balanced diet, with fluids • Passage of a brown, soft, formed, tubular shaped stool (feces) without pain • Flat abdomen • Active bowel sounds	
(S-128) Digestive System– Changes Due to Aging (1) • Decreased number of taste buds • Slowing of peristalsis causing constipation • Slower absorption of nutrients • Loss of bowel muscle tone • Loss of sphincter muscle tone • Digestion takes longer and less efficient with decreased absorption of necessary nutrients for homeostasis • Thinning of stomach lining	
(S-129) Digestive System – Changes Due to Aging (2) • Decrease in saliva causing difficulty chewing and swallowing • Decrease in amounts of digestive enzymes and saliva production • Decrease in appetite • Loss of teeth • Altered taste and smell • Proteins, vitamins, and minerals are not absorbed as well	
(S-130) Digestive System – Variation of Normal (1) • Difficulty swallowing or chewing	

• Poor intake of diet and fluids • Weight gain or loss • Loss of appetite • Abdominal pain and cramping • Blood, purulent drainage, mucus, or other discharge in stool	
(S-131) Digestive System – Variation of Normal (2) • Nausea and vomiting • Heartburn • Liquid stool (diarrhea) or hard stool/inability to pass a stool (constipation) • Pain when having a bowel movement • Whitish, black, red, or clay colored stool (unless food or iron supplement related) • Incontinence	
(S-132) Gastric Ulcer and Gastritis • Gastric peptic ulcer – raw sores in the stomach caused by excessive acid secretion that may cause bleeding • Signs and symptoms — Burning pain 1 to 3 hours after eating — Belching — Vomiting — Can cause bleeding resulting in black, tarry stool • Nurse aide's role is to report abnormal stools to the nurse, and be sure not to flush in case the nurse would like to assess stool • Encourage resident to follow prescribed diet as per care plan or nurse • Gastritis – inflammation of the lining of the stomach • Risk factors for gastritis — Use of certain pain relievers — Older adults increased risk of gastritis because the stomach lining tends to thin with age — Excessive alcohol use — Stress	
(S-133) Ulcerative Colitis • Chronic inflammatory disease of large intestine; serious condition that can result in a colostomy • Colostomy – a surgically created opening (stoma) through the abdomen into large intestine to allow stool to be expelled into a bag affixed to the abdomen	
(S-134) Gastroesophageal Reflux Disease (GERD) • Chronic condition when liquid contents of stomach back up into esophagus; very inflammatory and can damage the lining	

• Heartburn most common symptom caused by weakening of sphincter muscle joining esophagus to stomach; if untreated, causes ulceration • Nurse aide's role — Follow care plan — Evening meal eaten 3 to 4 hours before bedtime — Should remain upright 2 to 3 hours after eating — Provide extra pillows — Dietary modifications may also help	
(S-135) Constipation • Occurs when stool moves too slowly through the intestine. • Signs – abdominal swelling, flatus (gas), irritability, and verbalizing by resident of no recent bowel movement • Can result from decreased fluid intake, poor diet, inactivity, medications, aging, certain diseases, or not taking the time to have a bowel movement	
(S-136) Fecal Impaction • Hard stool stuck in the rectum and cannot be expelled, resulting in ongoing constipation • Signs – no stool for several days, oozing of liquid stool, cramping, abdominal distention (swelling), and pain in rectum • Nurse aides **<u>are not allowed</u>** to remove fecal impactions	
(S-137) The Enema • Specific amount of water that may or may not have an additive and is inserted into the colon to stimulate passage of stool • Doctor will write order for type and amount of fluid; four different types – tap water, soapsuds, saline, commercially prepared and pre-packaged • Follow facility's procedure for administering enemas	
(S-138) Digestive System – Nurse Aide's Role • Make sure dentures are in place and fit properly • Observe for choking if there is a history of trouble with chewing and swallowing • Provide fluids with meals • Encourage daily bowel movements • Residents with fecal incontinence must be kept clean and dry; follow infection prevention concept of wiping from front to back; assist resident with handwashing • Important for nurse aide to provide privacy when attending to elimination needs of resident; should not be rushed or interrupted • Fiber and drink plenty of fluids; should offer fluids each time nurse aide enters room (unless fluid restricted);	

healthy resident should drink about 64 ounces of fluid each day • Regular physical activity is very beneficial to elimination — Strengthens muscles of abdomen and pelvic which help with peristalsis — Immobility and lack of exercise weakens these muscles slowing down peristalsis and elimination — Encourage regular activity as tolerated and assist if needed • Understand bowel habits for each resident are individual and personal; determine bowel habits of resident; preferred time or times of day; typically, though elimination usually happens after meals • Ideal position for elimination is in a leaning forward, squatting position; if resident cannot get out of bed, assist with positioning so that resident is sitting up and by doing so allows for the resident to contract muscles and to work with gravity	
(S-139) Urinary System – Overview • The filtering system of the body • Responsible for removal of body waste products from the blood	
(S-140) Urinary System– Structure and Function • Kidneys — Bean-shaped paired organs — Located at the back of abdominal cavity, slightly above the waist — About four or five inches long and one inch thick — Filter waste from the blood and produce urine — Help maintain water balance and blood pressure in the body — Regulate the amount of electrolytes in the body	
(S-141) Urinary System – Structure and Function (1) • Ureters — Narrow tubes — Connect the kidneys to the urinary bladder — About a foot long (12 inches) • Urinary bladder — Muscular sac — Stores the urine until it passes from the body	
(S-142) Urinary System – Structure and Function (2) • Urethra — A tube — Located between the urinary bladder to the outside of the body — About seven or eight inches long in males and about one and a half inches long in females	

(S-143) Urethra – Female Versus Male • Think about the anatomy of the female urethra and the male urethra in terms of length • Note the difference between one and a half inches versus seven or eight inches and how the male and female genitalia differ	
ACTIVITY #H143 Female and Male Urethras: The goal of this activity is to examine the differences between the female and the male urethra. It is important for nurse aide students to understand why females get urinary tract infections more frequently than males: 1) the female urethra is shorter (about 1.5 inches) compared with the male urethra (7 to 8 inches), and 2) the female urethra is in front of the vagina and anus, close to sources of bacteria <u>Part 1</u> Cut 2 different straws – one that is 1.5 inches and one that is 7 to 8 inches – and show to students. Allow students to pass both straws around. Another variation of this is to give students their own pairs of straws that have been cut to size earlier and can tape on/in their notebooks. <u>Part 2</u> Using a male and a female mannequin (if you have two), point out how the urethra of the male is much longer than his female counterpart. Second, point out how far away the male urethra is from the anus compared to his female counterpart. [If you have one mannequin, you will have to change out the parts during this comparison.] The takeaway for the students is two-fold: first, the importance of catheter and perineal care for the female, and second, the importance of always wiping/washing front to back for the female resident.	
(S-144) Urination and Urine • The passing of urine from the bladder through the urethra to the outside of the body is called urination or micturition or voiding • Made up of water and waste products filtered from blood by kidneys • Many factors can change color of urine, such as medications, certain food and dyes and vitamins and supplements	

• B vitamins can cause urine to become bright yellow; beets can cause a pink or red color, and asparagus can cause green color	
(S-145) Urine – Normal Findings • Light yellow to amber in color • Clear or transparent when freshly voided, with a faint smell • About 1000 to 1500 milliliters per day	
(S-146) Urinary – Changes Due to Aging • Decreased kidney size and ability to filter blood • Decreased capacity, elasticity, muscular tone of bladder • Decreased ability to concentrate urine • Difficulty or incomplete emptying of urinary bladder • Enlargement of prostate in males • Many awaken several times at night to urinate • Sense of thirst lessens, resulting in less intake, resulting in less output which may lead to dehydration	
(S-147) Urinary System – Variation of Normal • Changes in urine — Color, cloudiness, odor, amount, frequency may indicate infection — Presence of sugar, acetone, blood, sediment in urine • Weight loss or gain • Swelling in arms or legs • Dysuria – pain or burning during urination • Swelling in bladder or abdomen • Pain in kidney or back • Incontinence • Fever	
TEACHING TIP #H147 Three Simulated Urine Specimens: Pass around 3 different simulated urine specimens: • Normal urine • 2 different variations of normal urine – urine with blood and urine with sediment Discuss differences of the 3 urine specimens or ask students to compare and contrast the 3 different specimens	
(S-148) Urinary Tract Infection (UTI) • Recall the differences in the female and male urethras, more common in females than males • An infection of urethra, bladder, ureter, or kidney commonly caused by a bacteria found in the digestive system (E. coli) • Signs include frequency, urgency, voiding in small amounts, pain, burning	

• Nurse aide's role – always wipe/wash from front to back (both resident and nurse aide); provide careful perineal care when changing adult briefs; encourage fluids; offer toileting opportunity at least every 2 hours; answer call lights promptly; showers are preferable to baths; report abnormal urine signs to the nurse	
(S-149) Kidney Stones • Also called renal calculi • Formed when urine crystallizes in kidneys • Can block kidneys and ureters causing severe pain • Signs include – abdominal pain, flank or back pain, painful urination, frequent urination, blood in urine, nausea, vomiting, chills, fever • Urine straining – process of pouring urine into a fine filter strainer to catch any particles; if found, save, and report to the nurse	
(S-150) Benign Prostatic Hypertrophy (BPH) • Disorder common in men over age of 60 • Prostate gland enlarges and causes pressure on urethra • Signs – frequent urination, dribbling of urine and difficulty beginning to urinate • Urinary retention (when urine remains in bladder) may occur, which can cause urinary tract infection; urine can further back up into the ureters and kidneys creating damage to structures • Nurse aide's role — Report signs of infection in urine — Report elevated temperature to the nurse — Provide perineal care or assist with care as needed	
(S-151) Chronic Kidney Disease (CKD) • Lasting damage of kidneys that worsens gradually; 5 stages; with the latter stages resulting in the need for dialysis • CKD can be prevented from advancing into further stages by controlling diabetes, maintain healthy blood pressure, exercise, and maintain a healthy weight	
(S-152) Urinary Incontinence • Inability to control bladder leading to an involuntary loss of urine, not normal part of aging • Can occur in residents who are dependent, confined to bed, paralyzed, elderly, or diseases of the nervous or circulatory system — Stress incontinence – loss of urine with sneezing or coughing — Urge incontinence – involuntary loss of urine from a sudden urge to void	

— Functional incontinence – loss of urine caused by cognitive, physical, or environment reasons — Overflow incontinence – loss of urine to bladder overflow or distention • Nurse aide's role — Answer call lights promptly — Check on resident for need to void frequently — Keep resident clean and dry — Urine can be irritating to the skin and a risk factor for pressure injuries — Change wet clothing and linen immediately — Encourage residents to drink fluids — Be respectful and provide reassurance to residents — Never refer to adult briefs as a diaper	
(S-153) Urination – Nurse Aide's Role • Residents with incontinence must be kept clean and dry; follow infection prevention concept of wiping from front to back; assist resident with handwashing • Important for nurse aide to provide privacy when attending to elimination needs of resident; should not be rushed or interrupted • To promote normal urination, nurse aide should encourage residents to drink fluids often and should offer fluids each time nurse aide enters room (unless fluid restricted) • Ideal position for urination for men is standing and for women, a sitting position • If resident cannot get out of bed, assist with positioning so that resident is sitting up and by doing so allows for the process to work with gravity	
(S-154 and S-155) Reproductive System - Male and Female Organs • Subdivided into two categories — The female reproductive system — The male reproductive system	
(S-156) Reproductive System – Structure and Function • Female reproductive structures include the uterus, fallopian tubes, ovaries, and vagina • Male reproductive structures include the penis, testicles, scrotum, and urethra • Responsible for production of reproductive cells, produce hormones responsible for sex characteristics, and reproduction	
(S-157) Reproductive System – Normal Findings • Absence of bleeding (other than menses) and vaginal discharge/penile discharge • Absence of pain and itching	

• Absence of enlarged prostate gland	
(S-158) Reproductive System – Changes Due to Aging • Decreased size and function of reproductive structures • Enlargement of prostate • Flaccid, sagging breasts • Loss of hair in vulva area • Weakened muscles that hold female reproductive organs in place	
(S-159) Reproductive System – Variation of Normal • Bleeding other than menses • Pain • Vaginal/penile discharge • Itching	
(S-160) Pelvic Organ Prolapse • Female reproductive organs held in place by muscles and connective tissue; pelvic organs may drop down (prolapse) into vaginal canal — Cystocele – when bladder drops down — Rectocele – when rectum shifts downward — Uterine prolapse – when uterus shifts downward • Incontinence may occur • Conditions range from mild to severe • Women may have tried Kegel exercises to attempt to tighten pelvic muscles • Nurse aide's role – provide perineal care as needed and report abnormal observations to the nurse	
(S-161) Endocrine System – Overview • System of glands that secrete chemicals directly into the bloodstream to regulate body functions • Different types of glands are pictured on slide	
(S-162) Endocrine System – Structure and Function • Structure – glands located throughout the body that secrete chemicals, called hormones that regulate bodily function • Function — Maintains homeostasis (balance) — Influences growth and development — Regulates glucose in the blood and calcium in the bones — Regulates reproduction — Regulates how fast cells burn food	
(S-163) Endocrine System • Normal Findings — Skin warm and dry — Awake, alert, and oriented	

— No variation of weight, appetite, and urination • Changes Due to Aging — Levels of hormones decrease — Insulin production decreases — Body is less capable to deal with stress	
(S-164) Endocrine System Blurred vision- With aging, the lens of the eyes become less flexible making it harder to focus on objects that are close. This is known as presbyopia and usually occurs for anyone over 40 but can also occur prematurely due to endocrine disorders such as diabetes.	
(S-165) Endocrine System – Variation of Normal (1) • Headache • Blurred vision • Dizziness • Weakness • Hunger • Irritability • Sweating • Dry skin	
(S-166) Endocrine System – Variation of Normal (2) • Confusion • Weight gain/loss • Appetite increase/decrease • Tiredness • Increase thirst • Increase urination	
(S-167) Diabetes Mellitus (Diabetes) • Most common disorder of endocrine system • Occurs when pancreas produces too little insulin or does not use insulin properly • Insulin needed for glucose to move from blood into cells; cells need glucose for energy • Without enough insulin, blood sugar builds up in blood; causing blood glucose levels to rise • CDC states more than 37.3 million Americans have diabetes and 96 million have prediabetes • Three types – Type 1, Type 2, and Gestational	
(S-168) Diabetes – Three Types • Type 1 – onset typically during childhood and early adulthood; pancreas does not produce insulin; lifelong condition; managed with daily doses on insulin, a special diet, and regular blood glucose testing	

• Type 2 – develops after about age 35; pancreas secretes insulin, but does not use it well; develops slowly; usually controlled by diet and oral medicine • A 3rd type is gestational diabetes that only occurs during pregnancy	
(S-169) Diabetes- Nurse Aide's Role • Follow care plan directives closely; ensure meals are served and resident eats his diet, report to the nurse if resident refuses a meal, observe intake of meal and document carefully; if meal is delayed for lab or other reason, retrieve meal as soon as resident is allowed to eat • Encourage resident to follow exercise program, which assists with circulation • Observe for signs of low blood sugar (hypoglycemia) and high blood sugar (hyperglycemia); low blood sugar may result from refusal of meal, delay of meal, or increase in exercise; report immediately to the nurse • Signs of hypoglycemia – hunger, vomiting, weakness, shakiness, sweating, headache, dizziness, fast pulse, low blood pressure, fast respirations, confusion, cool and clammy skin, convulsions, and unconsciousness • Signs of hyperglycemia – weakness, drowsiness, thirst, dry mouth, hunger, frequent urination, flushed face, sweet breath odor, respirations rapid and deep, blood pressure low, skin dry, headache, blurred vision, convulsions, and coma • Provide foot care as directed, observe for irritation or sores, and report immediately to the nurse	
(S-170) Immune System • Overview – this system protects the body both inside and outside • Structure – antibodies and white blood cells • Function — Protects the body from harmful infection-causing germs, such as bacteria and viruses — Provides immunity from certain diseases • Normal findings – body is able to fight infection • Changes due to aging — Immune system weakens and person more prone to getting infections — Person's immune system may attack itself causing disease	
(S-171) Immune System – Variation of Normal • Signs of infection – fever, redness, swelling • Anxiety • Nausea and vomiting	

• Stiff, swollen, and painful joints	
(S-172) Acquired Immune Deficiency Syndrome (AIDS) • AIDS is caused by a virus, HIV that attacks the immune system by destroying cells of the body that fight diseases • HIV is spread through bodily fluids including blood, semen, vaginal secretions, and breast milk • In 2021 Centers for Disease Control and Prevention (CDC) estimates 1.2 million individuals in United States have HIV and nearly 1 person for every 7 do not know they have it. • HIV Screening is vital knowledge because new medical advances are slowing the progression of the virus, and some individuals may never develop AIDS.	
(S-173) Immune System – Nurse Aide's Role • Follow Standard Precautions and Blood Borne Pathogen Standards as nurse aide cares for a resident with AIDS • Assist with activities of daily living as needed • Provide fluids as ordered • Measure and record I&O and obtain weights • Encourage deep-breathing and coughing exercises as directed • Encourage self-care as tolerated • Monitor and report signs of infection • Provide emotional support	
(S-174) Immune System- Other Common Disorders • Lupus – immune system attacks tissues causing redness, pain, swelling, and damage • Graves' disease – immune system attacks thyroid gland which causes it to secrete more thyroid hormone • Multiple Sclerosis - immune system destroys the protective covering of the nerves resulting in decreased communication between the brain and the rest of the body • Nurse aide's role — Monitor and report signs of infection — Follow standard precautions — Provide for nutrition, hydration, and rest for the resident	
ACTIVITY #H174 Experiencing Changes with Aging and/or Disability – Group: Refer to Instructor's Guide	

Instructor's Guide to Activity #H174
Experiencing Changes with Aging and/or Disability

Preparation

Before class begins, create instruction cards using card stock paper or laminated computer paper. Set up 5 stations, in the lab, in the following manner:

Station #1 – Visual Impairment

For station #1, have the following items available for student use: laminated/card stock instruction card #1; a pair of goggles with petroleum jelly or water-soluble lubricant rubbed on the eyepieces; a newspaper; and shoebox with a variety of small objects

Station #2 – Hard of Hearing

For station #2, have the following items available for student use: laminated/card stock instruction card #2; cotton balls (2 per student)

Station #3 – Musculoskeletal Impairment of the Hands

For station #3, have the following items available for student use: laminated/card stock instruction card #3; pairs of gloves for each student with one cotton ball in each fingertip of each glove; a needle and a 2-foot piece of thread; and a small change purse with at least one dime

Station #4 – Musculoskeletal Impairment of the Lower Extremities

For station #4, have the following items available for student use: laminated/card stock instruction card #4; a pair of extra-large pants and a chair; and a walker

Station #5 - Blindness

For station #5, have the following items available for student use: laminated/card stock instruction card #5; a nurse aide resource card; a chair; a meal tray, with a generic diet card, and an assortment of foods on a plate – minimum of 3 types (pudding, applesauce, gelatin, etc.) covered with plastic wrap, with lid over the plate, placed on an over-bed table; and a scarf/headband/bandana

Instructions to the Students

After putting students in pairs, point out the 5 stations that each pair will be rotating through. Explain that each pair of students will go to a station, read the instruction card, and follow the instructions on the card. In each pair, the students will take turns being the nurse aide and the resident, at each station. The students will rotate to the next station when the instructor rings a bell or yells out, "new station."

Special Situations

If you have an odd number of students, you or possibly another instructor could pair up with the extra student. If you have more than 10 students, you can set up extra stations with word searches, crossword puzzles, displays of adaptive devices the students could manipulate and use. You could also duplicate some of the easier stations to accommodate larger numbers of students.

Activity Follow-up Discussion Questions

After each of the pairs of students has completed all stations, bring everyone together for discussion. Suggested questions are listed below. You may want to add additional questions to facilitate discussion.

- How did it feel to do these situations in the different stations?
- Which situation was the most difficult for you as the resident?
- Which situation was the easiest for you as the resident?
- Which three situations was the nurse aide not being helpful? [Answer – Situation #2 when the nurse aide was giving the resident directions to the nearest grocery store or post office, the nurse aide spoke softly and cover his/her mouth with the hand; Situation #3 when the nurse aide rushed the resident while the resident was trying to thread the needle and when the nurse aide told the resident to use his/her own money to buy the nurse aide a drink; Situation #4 when the nurse aide told the resident to get dressed and that he/she was too busy to assist]
- How did the nurse aide feel when this happened? How did the resident feel when this happened?
- Which of the situations could possibly be considered normal changes of aging? [Situation #1 Visual Impairment; Situation #2 Hard of Hearing; and Situation #3 Musculoskeletal Impairment of the Hands]
- Have you had to care for any of your relatives or friends in similar situations? If so, what were the circumstances?

Station #1 – Visual Impairment

For station #1 (newspaper activity):

Resident:
- Put on the goggles and read the newspaper where the nurse aide indicates for you to read

Nurse Aide:
- Point out parts of the newspaper where the resident is supposed to read – large print first and then progressing to smaller print
- Read newspaper paragraph to the resident at the point where they cannot read

For station #1 (shoebox activity):

Resident:
- Put on the goggles and remove the objects from the shoebox that the nurse aide indicates for you to remove

Nurse Aide:
- One at a time, request that the resident remove a specific object from the shoebox

SWITCH ROLES

Station #2 – Hard of Hearing

For station #2 (directions):

Resident:
- Put a cotton ball in each ear
- Ask the nurse aide to give you directions to the nearest post office or grocery store

Nurse Aide:
- Give the resident directions per request
- Speak softly and cover mouth with your hand so resident cannot read your lips

For station #2 (favorite recipe):

Resident:
- Keep cotton balls in each ear
- Ask the nurse aide to tell you how to make one of their favorite recipes

Nurse Aide:
- Give the resident instructions for the recipe per request
- Speak in a tone that is audible to the resident, while facing resident

SWITCH ROLES

Station #3 – Musculoskeletal Impairment of the Hands

For station #3 (needle and thread):

Resident:
- Put on a pair of gloves
- Thread the needle when requested by the nurse aide

Nurse Aide:
- Instruct the resident to thread the needle
- Be impatient. Ask the resident to speed it up.

For station #3 (small change purse and dime):

Resident:
- Open the change purse
- Get out a dime
- Put the dime in the slot of a vending machine (if available in the building), press the return button, then return the dime back to the change purse

Nurse Aide:
- Instruct the resident to go get a drink out of the vending machine for you, using the resident's own money and be impatient. Ask the resident to speed it up.

SWITCH ROLES

Station #4 – Musculoskeletal Impairment of the Lower Extremities

For station #4 (putting on pants):

Resident:
- Sit in chair
- Put on pants using arms and hands only, you cannot move your body from the waist down to your toes when directed to do so by the nurse aide
- Notice how far you were able to get the pants on without assistance

Nurse Aide:
- Tell the resident that it is time to get dressed and that you are too busy to help them. Leave the area to become the resident (proceed to the walker portion of station #4)

For station #4 (walker):

Resident:
- Walk with walker out of the classroom, down the hall to the water fountain, get a drink of water from the water fountain, and come back to station #4

SWITCH ROLES

Station #5 – Blindness

For station #5 (locating food):

Resident:
- Put scarf/headband/bandana over eyes
- Sit in chair
- Follow instructions of the nurse aide

Nurse Aide:
- After the resident is seated in chair and blindfolded, you need to address the resident by name and then state your name, your title, and why you are here (assist with meal tray)
- When resident is seated in the chair, move the over-bed table in front of the resident
- Tell the resident that it is time to eat
- Remove the cover of the plate, but do not remove the plastic wrap
- Tell the resident to feel the plate in front and to think about the face of a clock
- Tell the resident that the _____ (name of food) is located at 2 o'clock
- Tell the resident to touch the _____ (same food as above)
- Continue to describe the other two foods in the same manner and have the resident touch each food when directed

For station #5 (ambulate):

Resident:
- Keep scarf/headband/bandana in place over eyes
- Ambulate with nurse aide, following instructions

Nurse Aide:
- Ambulate resident out of the room, down the hall, back to the room, and back to the chair (read the resource card for tips)

SWITCH ROLES

Station #5 – Blindness Resource Card

When assisting a resident who is blind to walk:

- Ask if the resident would like help to walk
- Offer your arm to the resident and tell the resident which arm you are offering
- Tap the back of your hand against the resident's hand
- Request that the resident hold on to your arm just above the elbow
- Walk at a normal pace, one step ahead of the resident
- Pause just before you change directions
- Pause before going up or down a step and tell resident if step is going up or going down and how many steps there are
- Warn the resident about stairs, elevators, turns, doors, furniture, and other obstacles.

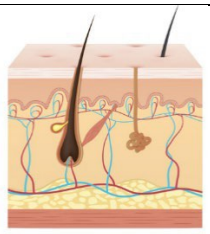
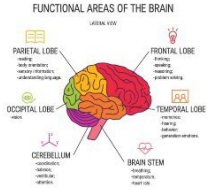
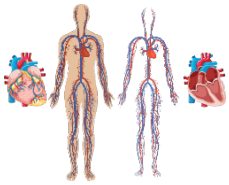
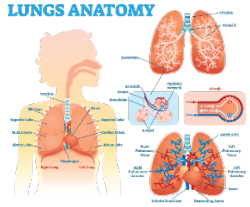
Module H- #H22 Teaching Guide
Appendix 1 Alternative Classroom Instruction

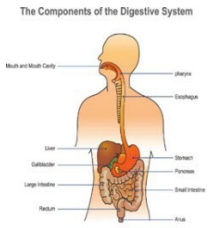
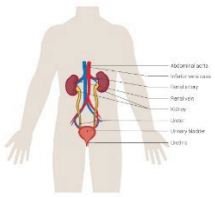
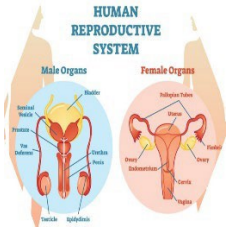
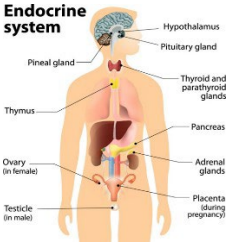
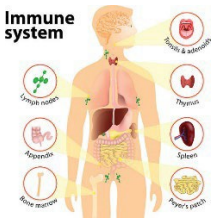
1. Assign each student one of the following body systems integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems.
2. Explain they are to cover each topic listed on **Handout #H22** for their assigned body system.
3. The students will present their body system using the notes from current NC Nurse Aide I Curriculum - Module H power point and student manual.
4. The instructor will facilitate the knowledge, making sure all aspects of the listed topics are covered.
5. Students will complete **Handout #H22** while listening to each student's body system presentation.
6. If there are more or fewer students than body systems, assign students in groups as needed.
7. Students are to draw a diagram and label the organs of their assigned body system. The diagram should be created on a separate sheet of paper, at least 8 ½ x 11. The diagram on the worksheet is for reference only.
8. Once all presentations have been presented to their class and students have filled in information in their Handout #H22, guide students in a cooperative learning Carousel strategy. Place posterboard titled for each body system, integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems on the walls of the classroom. Divide students into groups depending on your class size and give them a colored marker to represent their group. Setting a timer for 1 minute, each group moves from board to board adding information they remember from the worksheet using their group's colored marker. Allow each group to go to each posterboard a minimum of two times. Once two or more rounds are complete, bring the class back together and discuss in detail important points during the review noting anything omitted from the Carousel activity. The colored markers quickly identify groups who may need further education to make sure they have met all objectives of Module H.

The alternative assignment for Module H is a student-led module. Power points and student manual are to be used as references for students as they complete their assigned presentations. The instructor becomes the facilitator and not the direct line of knowledge until **all** activities for Module H have been completed. Make the assignment early in the course with an expected due date for presentations and Cooperative Learning Carousel Activity.

Module H Activities are still required to be completed. It is up to the instructor to determine when the activities will be completed as long as concluded by the last day of presentations and the Carousel activity noted above.
For further information related to cooperative learning strategy, Carousel, see links below.
https://shelleygrayteaching.com/carousel/
https://www.acteonline.org/teaching-strategy-the-carousel/

Handout #H22 Body Systems

System	Integumentary	Musculoskeletal	Nervous	Cardiovascular	Respiratory
Function					
Diagram					
Organs					
Disorders					

Changes due to Aging					
System	**Digestive**	**Urinary**	**Reproductive**	**Endocrine**	**Immune**
Function					
Diagram					
Organs					

Disorders					
Changes due to Aging					