NC Department of Health and Human Services

NC Nurse Aide I Curriculum

Module H
Body Systems
July 2019

Objectives (1)

- **Identify the structure and function of the cell and the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems**
- **Describe the nurse aide's role in the provision of care for a resident with cancer**

Objectives (2)

- **Discuss changes in the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems due to aging**
- **Compare and contrast normal findings and variation of normal findings of the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems**

Objectives (3)

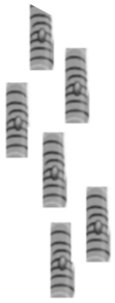
- Describe common disorders of the integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems
- Describe the nurse aide's role related to a resident's integumentary, musculoskeletal, nervous, cardiovascular, respiratory, digestive, urinary, reproductive, endocrine, and immune systems

Module H Body Systems

Cell Theory

Cell Theory – Overview

- 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



Cells – Structure and Function

- 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
- Combine to form tissue

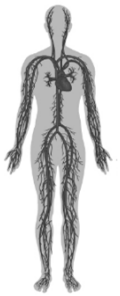
Tissue – Structure and Function

- Carry out a particular activity or function
- Types – epithelial, connective, muscle, nerve
- Grouped together to form organs

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

System – Structure and Function



- Made of groups of several organs functioning together for a specific purpose or purposes
- Combine to form an organism
- Examples of systems?

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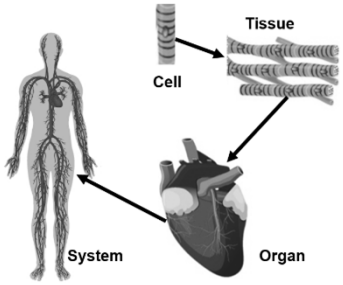

In Summary, Organization of the Body

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Organism – Structure and Function

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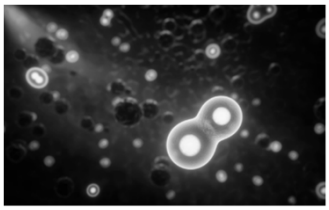
Cells – Normal Findings

Reproduce for tissue growth and repair in a controlled and orderly manner

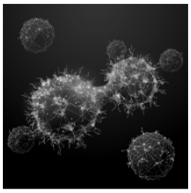


Cells – Variation of Normal

Tumor – group of abnormally growing cells; may be benign or malignant

Cancer (CA)

- Abnormal cells grow in uncontrolled manner, invade surrounding tissue; may spread to other areas
- Can occur almost anywhere in or on body; commonly occurs on skin, in lung, colon, breast, prostate, uterus, ovary, bladder, and kidney



Cancer – Risk Factors (1)

Second largest cause of death

Age – getting older most important risk factor

Tobacco – actual use and second-hand

Radiation – sunlight,

Infections – certain viruses and bacteria

Cancer – Risk Factors (2)

Immuno-suppressive drugs

Alcohol

Diet – high in fat, protein, calories, and red meat

Cancer – Risk factors (3)

Hormones – female hormones

Obesity

Environment – air pollution, second-hand smoke, and asbestos

Cancer – Warning Signs (CAUTION)

- **Change in bowel or bladder habits**
- **A sore that does not heal**
- **Unusual bleeding or discharge from any body opening**
- **Thickening or lump in breast or elsewhere**
- **Indigestion or difficulty swallowing**
- **Obvious change in a wart or mole**
- **Nagging cough or hoarseness**

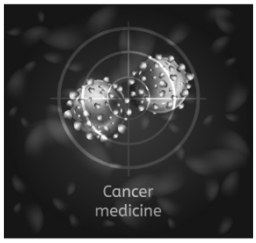
Cancer Treatment

Goals – cure, control, reduce signs and symptoms from disease and treatment

Key is to find cancer early

Dependent on type, site, size, and if it has spread

Includes – surgery, radiation, chemotherapy, others (hormone, stem cell transplants, alternative)



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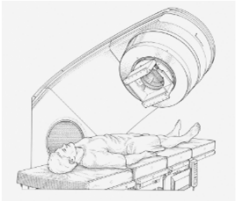
Cancer – Radiation Therapy (1)



Kills cancer cells using X-ray beams aimed at tumor or radioactive material implanted at or near tumor

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Cancer – Radiation Therapy (2)

Side Effects

- **At site – sore, irritated, redness, blistering**
- **Head and neck – dry mouth, sore throat**
- **Tiredness**
- **Discomfort, nausea, vomiting, diarrhea, loss of appetite**

Nurse aide care directed at minimizing side effects and providing emotional support

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Cancer – Chemotherapy (1)

- Affects whole body; both cancer cells and normal cells
- Targeted therapy can tell the difference
- May be given orally or intravenously,
- Be aware of safety needs handling body fluids

Cancer – Chemotherapy

Side Effects
(depend on drug(s) used)

- Hair loss
- Digestive disturbances
- Stomatitis
- Decreased blood cell production
- Changes in thinking and memory
- Emotional changes

Nurse aide care directed at minimizing side effects and providing emotional support

Cancer – Nurse Aide's Role

Resident's needs include:

- Pain relief or control
- Balance of rest and exercise
- Fluids and nutrition
- Prevention of skin breakdown
- Prevention of bowel problems
- Dealing with side effects of treatment
- Psychologic and social needs
- Spiritual needs

Cancer – Nurse Aide's Role (1)

- Understand that each resident is different
- Social interaction
- Proper nutrition
- Pain control
- Assist with comfort and circulation
- Skin care
- Mouth care

Cancer – Nurse Aide's Role (2)

Observe for and report to the nurse 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

Cancer – Nurse Aide's Role (3)

Self-image – may be an issue; hair loss common side effect

Nurse Aide's Role

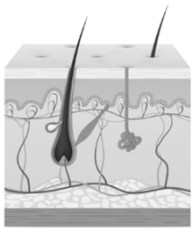
Visitors and family – if visit is positive one, do not intrude; watch for and report negative interactions to the nurse during visits

Module H Body Systems

Integumentary

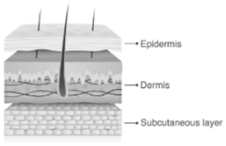
Integumentary – Overview

- **The skin**
- **Largest organ and system in the body**
- **Has accessory structures – hair and nails**
- **Responsible for providing a natural protective covering of the body**



Integumentary – Structure

- Epidermis
  - Outer layer
  - Living and dead cells
  - No blood vessels, only few nerve cells
- Dermis
  - Inner layer
  - Made up of connective tissue
  - Has blood vessels, nerves, sweat glands, oil glands, and hair roots
- Subcutaneous (fatty) tissue – thick layer of fat and connective tissue



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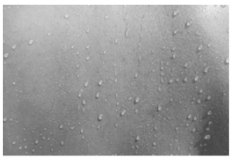
Integumentary – Function

- Protects body from injury and pathogens
- Regulates body temperature
- Eliminates waste
- Contains nerve endings for cold, heat, pain, pressure and pleasure
- Stores fat and vitamins



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Integumentary – Normal Findings

- Warm, dry
- Absence of breaks, rash, discoloration, swelling

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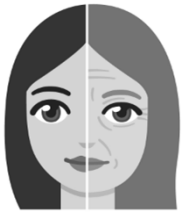
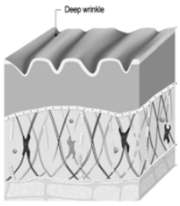
Integumentary – Changes Due to Aging

- Skin is thinner, drier, more fragile
- Loses elasticity
- Fatty layer decreases; person feels colder
- Hair thins and may gray



Integumentary – Changes Due to Aging (1)

- 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



Integumentary – Variation of Normal

- Breaks in skin
- Pale, white or reddened areas
- Black and blue areas
- Changes in scalp or hair

Integumentary – Variation of Normal (1)

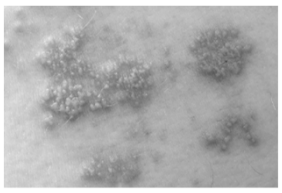
- Rash, itching or skin discoloration
- Abnormal temperature
- Swelling

Integumentary – Variation of Normal (2)

- Ulcers, sores, or lesions
- Swelling
- Dry or flaking skin
- Fluid or bloody drainage

Shingles (Herpes Zoster)

- Caused by virus
- Rash or blisters on one side of body, burning pain, numbness, and itching; lasts about 3 to 5 weeks
- Infectious until lesions are crusty



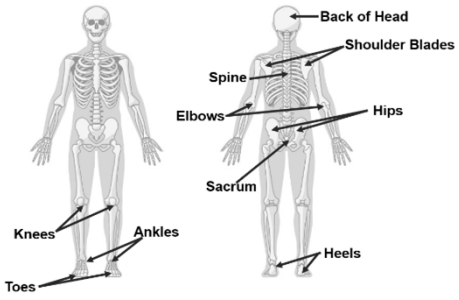
Stasis Dermatitis

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

The Pressure Injury

- **Any lesion caused by unrelieved pressure that results in damage to underlying tissues; friction and shear are factors**
- **Many pressure injuries occur within first 4 weeks of admission to the facility**

Bony Prominences



Pressure Injury – Terms

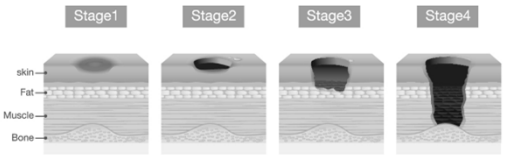
Shear – when layers of skin rub up against each other; or it could be when skin remains in place, but tissues underneath move and stretch
Friction – rubbing of one surface against another
Unavoidable pressure injury – a pressure injury occurs despite efforts to prevent one
Avoidable pressure injury – one that develops from improper use of the nursing process

Pressure Injury – At Risk

- **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**

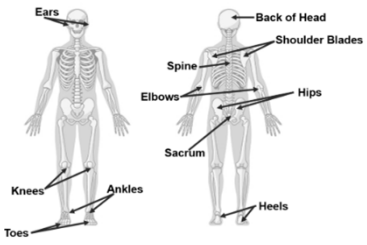
Pressure Injuries – Residents at Risk

Pressure Injury – Stages



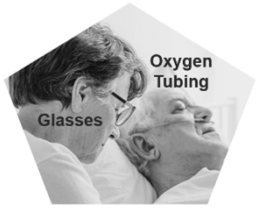
Pressure Injury – Pressure Points

Occur over bony areas; include back of head, ears, shoulder blades, hips, spine, sacrum, knees, ankles, and heels



- **Objects can contribute to pressure injury – eye glasses, oxygen tubing, tubes, casts, braces**
- **Obese people can have pressure areas occur where skin is in contact with skin**

Pressure Injury – Sites



Pressure Injury – Prevention is the Key

- Identify residents at risk
- Measures directed at 1) handling, moving, and positioning of the resident and 2) providing skin care

Handling, Moving, and Positioning

- Follow repositioning schedule
- Use assistive devices (pillows, foam wedges); support feet properly
- Do not position on red area, pressure injury, on tubes or other medical devices
- Prevent bed friction
- Prevent shearing
- Keep feet and heels off bed

The 30° Lateral Position

- Bed is not raised more than 30°
- Pillows are placed under head, shoulder, and leg
- Position lifts up the hip to avoid pressure on the hip at about a 30° angle
- Person does not lie on hip as with the side-lying position

Providing Skin Care

- Inspect skin
- Do not use hot water; use cleansing agent
- Prevent incontinence
- Check for drainage
- Apply moisturizer
- Give a back rub when repositioning
- Keep linen clean, dry, and free of wrinkles
- Avoid scrubbing vigorously
- No heat directly on pressure injury

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Module H Body Systems

Musculoskeletal

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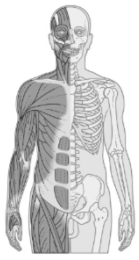
Musculoskeletal – Overview



Provides structure and movement for the body

Protects and gives the body shape

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Muscles – Structure

Over 600 muscles made up of elastic tissue

Some connected to bones by tendons

Involuntary – cannot be controlled

- **Cardiac – in the heart; striated**
- **Smooth – control action of organs; smooth**

Voluntary can be controlled

- **Skeletal – attached to the bones; arms and legs; striated**

Muscles – Function

Power movement of skeleton
Give body form (or posture)
Produce most of body heat, through contraction

Skeleton and Bones – Structure

The Skeleton

- **Has 206 bones**
- **Framework of the body**

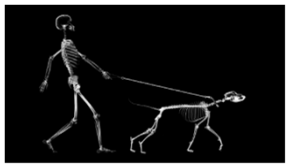
Bones

- **Outside is hard and rigid**
- **Covered with periosteum,**
- **Bone marrow, located inside; soft and spongy**
- **Connected to other bones by ligaments**
- **Connected to muscles by tendons**

Skeleton and Bones – Function

The skeleton

- Provides framework for body
- Protects organs



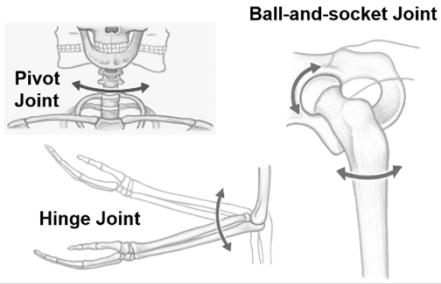
Bones

- Allow body to move
- Store calcium
- Make and store blood cells (in bone marrow)

Joints – Structure

- Point where bones meet; made up of cartilage
- Synovial membrane lines joints
- May be movable, slightly movable, or immovable
- Ligaments hold bones together
- Types – ball-and-socket, hinge, and pivot

Types of Joints



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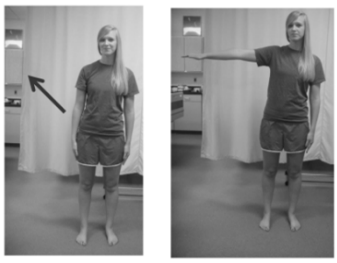
Musculoskeletal – Normal Findings (1)

- Ability to perform routine movements and activities of daily living
- Ability to perform full range of motion exercises bilaterally, without pain

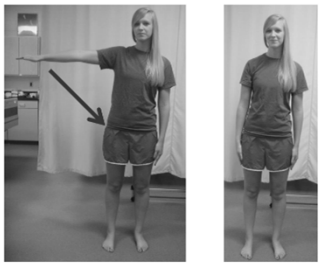
Musculoskeletal – Normal Findings (2)

Abduction of the arms bilaterally without pain



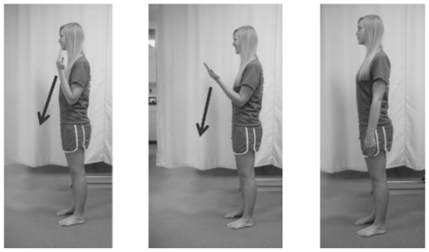
Musculoskeletal – Normal Findings (3)

Adduction of the arms bilaterally without pain



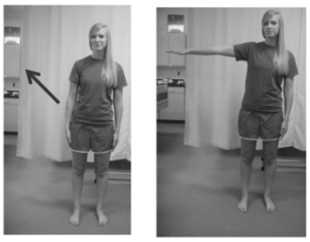
Musculoskeletal – Normal Findings (4)

Extension of arm bilaterally without pain



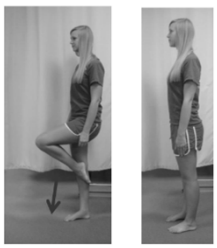
Musculoskeletal – Normal Findings (5)

Flexion of arm bilaterally without pain



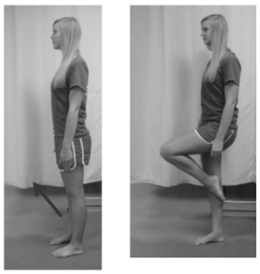
Musculoskeletal – Normal Findings (6)

Extension of leg bilaterally without pain



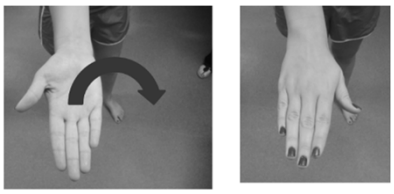
Musculoskeletal – Normal Findings (7)

Flexion of leg bilaterally without pain



Musculoskeletal – Normal Findings (8)

Pronation bilaterally without pain

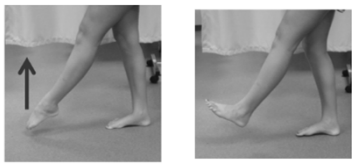


Musculoskeletal – Normal Findings (9)

Supination bilaterally without pain

Musculoskeletal – Normal Findings (10)

Dorsiflexion bilaterally without pain



Musculoskeletal – Normal Findings (11)

Plantar flexion bilaterally without pain

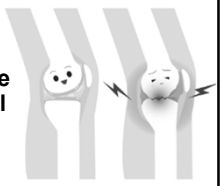
Musculoskeletal – Normal Findings (12)

Opposition bilaterally without pain

Musculoskeletal – 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



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Musculoskeletal – Changes Due to Aging (2)

- Height decreases from 1 to 2 inches
- Slowed recovery from position changes and sudden movement
- Pain when moving
- Reaction time, movement speed, agility, and endurance decrease
- Poorer response to stimuli

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Musculoskeletal – Variation of Normal (1)

- 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

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Musculoskeletal – Variation of Normal (2)

Arthritis

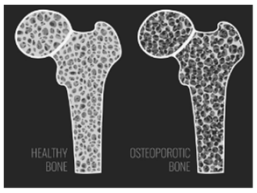
Inflammation or swelling of the joints; causes stiffness, pain, and decreased mobility; two common types

Osteoarthritis – elderly; may occur with aging or joint injury; usually weight-bearing hips and knees involved

Rheumatoid arthritis – any age; starting with smaller joints then progressing to larger ones

Arthritis – Nurse Aide's Role

Osteoporosis



Bones lose density causing them to become porous and brittle; bones break easily; has low back pain, stooped posture, becoming shorter, and broken bones

Fracture

Broken bone caused by an accident or osteoporosis; closed or open break; most common – fractures of arms, wrists, elbows, legs and hips

Goal: 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

Hip Fracture

Total Knee Replacement (TKR)

Replacement of knee with a prosthesis; performed to relieve pain and restore mobility damaged by arthritis or injury

Goals – prevent blood clots, special stockings and machines used; speed up recovery, decrease stiffness, increase range of motion

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Amputation

Surgical removal of some or all of a body part; occurs – arm, hand, leg, foot; causes: disease or accident

- **Assist with activities of daily living**
- **Provide support if phantom statements made; do not argue**
- **Assist with position changes and range of motion exercises**
- **Follow care plan in regards to prosthetic care**

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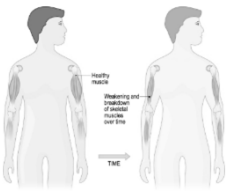
Contracture and Muscle Atrophy

Contracture – muscle or tendon shortens, freezes, becomes inflexible; permanent disability

Muscle atrophy – muscle wastes away, decreases in size; becomes weak, from disuse

Prevention of these two conditions critical



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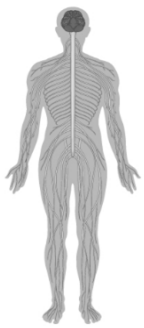
Musculoskeletal System

Nurse Aide's Role

Prevention, Prevention, Prevention!

Module H Body Systems

Nervous System

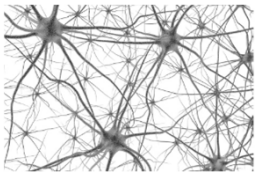


Nervous – Overview

- Controls and coordinates all body functions
- Reflex centers for heartbeat and breathing
- Senses and interprets information and responds to changes

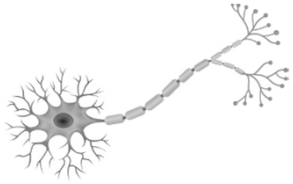
Nervous – Overview (1)

Consists of two main divisions



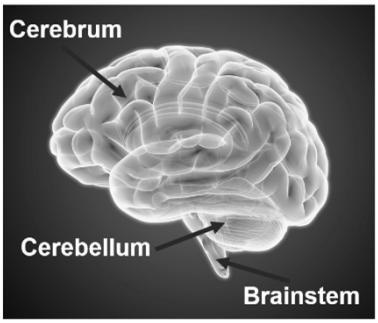
1. **Central nervous system (CNS) – brain and spinal cord**
2. **Peripheral nervous system – includes nerves that travel throughout the body**

The Neuron (Nerve Cell)



Basic unit of nerves and the nervous system
Carries messages or impulses through spinal cord to and from the brain

The Brain – Structure and Function

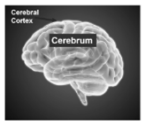


Brain – The Cerebrum

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



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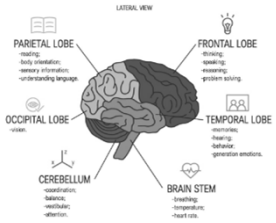
Brain – The Cerebrum

Each side of your brain contains four lobes



Frontal
Temporal
Parietal
Occipital

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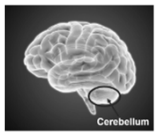
The Brain

Cerebellum

Controls balance and regulates voluntary muscles

Produces and coordinates smooth movements



Brain Stem

Regulatory center

Controls heart rate, breathing, swallowing, opening/closing blood vessels

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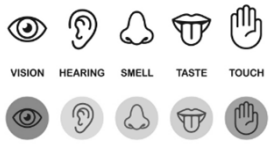
Spinal Cord and Sensory Organs

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
Receive impulses from environment and relay impulses to brain

Nervous – 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**



Nervous – Changes in Aging

- **Some hearing loss**
- **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**

Nervous – Changes in Aging

- Loss of nerve/brain cells
- Decreased sensitivity to heat and cold
- Slowed response and reflex time
- Reduced sense of touch
- Reduced sensitivity to pain
- Reduced blood flow to brain
- Forgetfulness
- Decreased function in senses

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Nervous – Variation in Normal

- Changes in speech, vision, or hearing
- Loss of feeling or inability to move one side of body
- Numbness, dizziness, nausea
- Jerking motions or tremors
- Changes in gait or movement
- Paralysis
- Seizures
- Confusion

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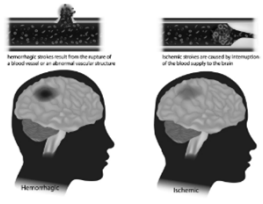
Stroke (CVA, Cerebrovascular Accident)

- Caused when (1) a blood vessel leaks or breaks in the brain; or (2) when oxygen to an area is disrupted the blood supply to part of the brain is blocked



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Stroke

Cerebrum is divided into right and left sides: right controls left; left controls right

Each side contains four lobes

Area of brain and size of the area affected by injury will impact severity, signs and symptoms, extent of disability, and prognosis

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After the Stroke, Resident May Experience

- Hemiplegia
- Hemiparesis
- Expressive aphasia
- Receptive aphasia
- Emotional lability
- Loss of sensations
- Loss of bowel and bladder control
- Cognitive impairment
- Dysphagia

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Stroke – Nurse Aide's Role

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Parkinson's Disease

- **Progressive, incurable disease causes a part of the brain to degenerate**
- **Nurse aide's role – protect resident, assist with ambulation assist with activities of daily living and assist resident with self-care**

Head and Spinal Cord Injuries

Diving accidents, sports injuries, motor vehicle accidents, and war injuries; injuries range from mild concussion to coma, paralysis, and death

Head and Spinal Cord Injuries (1)

- **Head injuries may cause permanent brain damage; disabilities related to part of brain injured**
- **Severity of spinal cord injuries depend on level and force of injury in regards to spinal cord; higher the injury, greater the loss of function**

Head and Spinal Cord Injuries (2)

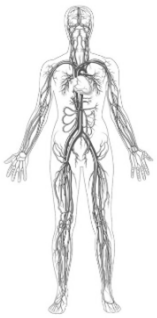
Nurse aide's role: provide emotional support and realize that the resident may exhibit feelings of anger and frustration

Module H Body Systems

Cardiovascular

Cardiovascular System

- **Also called the circulatory system**
- **The continuous movement of blood through the body**



Cardiovascular – Changes Due to Aging

- Heart muscle less efficient
- Blood pumps with less force
- Arteries lose elasticity and become narrow
- Blood pressure increases

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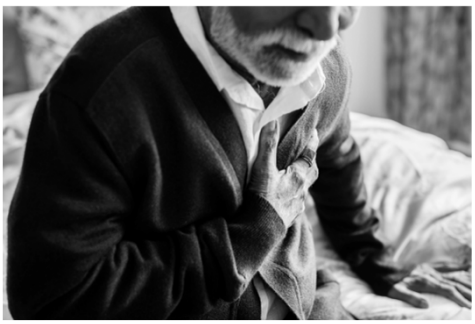
98

Cardiovascular – Variation of Normal (1)

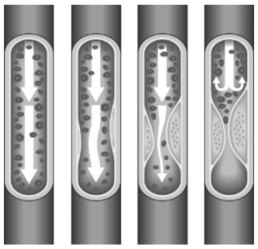


Cardiovascular – Variation of Normal (2)

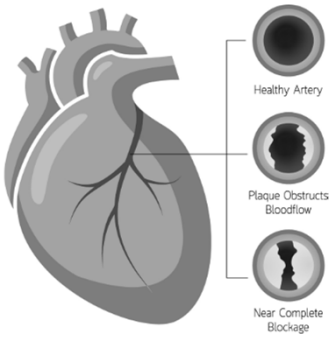
- Swelling of hands and feet
- Pale or bluish lips, hands, or feet
- Weakness and tiredness
- Weight gain

Hypertension (High Blood Pressure)

- Major cause is atherosclerosis or "hardening of the arteries"
- Arteries harden due to plaque build-up from fatty deposits
- May complain of headache, blurred vision, and dizziness



Coronary Artery Disease (CAD)



Angina Pectoris (Angina)

Occurs when heart muscle is not getting enough oxygen

Chest pain, tightness of chest, pain radiating up the jaw, down the left arm, may sweat and get short of breath

Exercise, stress, excitement, digesting a big meal require additional oxygen; with CAD, the narrowed blood vessels keep heart muscle from getting enough oxygen

Myocardial Infarction (MI, Heart Attack)

An emergency 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

If resident survives, cardiac rehabilitation is ordered

Peripheral Vascular Disease (PVD)

Poor circulation of legs, feet, arms, hands due to fatty deposits that harden in blood vessels

- **Signs – nail beds and feet pale or blue, swelling in hands and feet, ulcers of legs and feet, pain while walking**
- **Follow care plan directive regarding elastic stockings**

Congestive Heart Failure (CHF)

When one or both sides of heart stop pumping blood effectively; all the conditions can cause severe damage to the heart muscle, resulting in heart not being able to pump effectively

Cardiovascular System – Nurse Aide's Role

- Monitor vital signs, report abnormal values
- Assist with special diet needs; measure I&O
- Provide rest periods
- Report complaints of chest pain immediately
- Reduce stressful situations

Module H Body Systems

Respiratory

Respiratory – Structure and Function

3 Regions

- Thorax
- Upper Respiratory Tract
- Lower Respiratory Tract

Function

Involves the breathing in of oxygen (inspiration) and the breathing out of carbon dioxide (expiration)

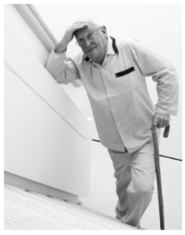
Respiratory – Changes Due to Aging

- Respiratory muscles weaken
- Lung tissue becomes less elastic
- Shortness of breath with exertion
- Lung capacity decreases
- Oxygen in blood decreases
- Muscles of diaphragm become weaker
- Limited expansion of chest

Respiratory – Variation of Normal (1)

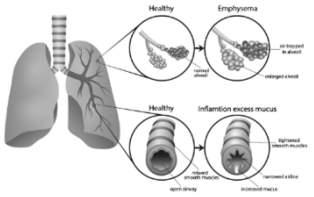
- Shallow breathing or breathing through pursed lips
- Coughing or wheezing
- Nasal congestion or discharge
- Productive cough
- Noisy respirations; gasping for breaths

Respiratory – Variation of Normal (2)



- Cyanosis – changes in skin color, pale or bluish color of lips and extremities
- Dyspnea – difficulty breathing
- Changes in rate and rhythm of breathing
- Need to sit after mild exertion
- Pain in chest

Chronic Obstructive Pulmonary Disease



COPD; chronic, progressive disease causing trouble breathing, particularly getting air out of lungs

COPD

Residents 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

Residents feel out of control; fear suffocation

Lung of Smoker With COPD

COPD Signs

- Chronic cough or wheeze
- Difficulty breathing
- Shortness of breath with exertion
- Pale cyanotic reddish-purple skin
- Confusion
- Weakness
- Difficulty in finishing meal
- Fear and anxiety

COPD – Nurse Aide's Role

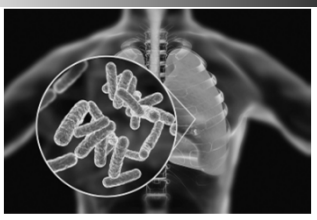
- Help sit up or lean forward supported with pillows
- Offer fluids and small, frequent meals
- Support pursed-lip breathing
- Observe oxygen in use (NEVER adjust)
- Be supportive of fears
- Follow infection prevention principles
- Encourage rest periods

COPD Resident Report to Nurse

- Signs/symptoms of colds or illness
- Changes in breathing, lung secretions
- Changes in mental state
- Excessive weight gain
- Increasing dependency on staff and family

Pneumonia

Acute infection of lung or lungs caused by bacteria, virus, or fungus



Resident with COPD at great risk for developing pneumonia, especially if weakened

A Person With Asthma

Healthy (the blue one) and unhealthy (the red one) bronchial tubes; unhealthy one results in a constricted breathing problem

Asthma

- Chronic inflammatory disease, occurs when respiratory system is hyperreactive to irritants
- When bronchi become irritated, they constrict, making it difficult to breathe
- Responding to irritation and inflammation, mucus membranes produce thick mucus further inhibiting breathing
- Air is trapped in lungs causing coughing and wheezing

Upper Respiratory Infection (Cold)

- Viral or bacterial infection of nose, sinuses, and throat
- Signs – nasal drainage, sneezing, sore throat, fever, and tiredness
- Remedy – body's immune system, fluids, and rest

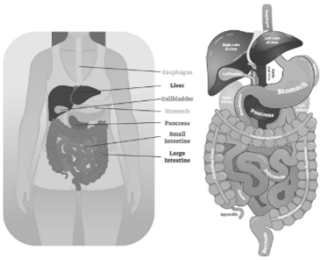
Respiratory System – Nurse Aide's Role

- Provide rest periods at intervals
- Encourage exercise and regular movement
- Encourage and 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

Module H Body Systems

Digestive

Digestive System – Overview

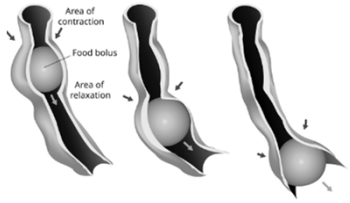


Also known as the gastrointestinal system and abbreviated as GI system

Digestive – Structure and Function

- Upper GI structures – mouth, pharynx, esophagus and stomach
- Lower GI structures – small intestines and large intestines
- Accessory structures include teeth, tongue, salivary glands, liver, gall bladder, and pancreas
- GI System digests food, absorbs nutrients, and eliminates waste

Peristalsis



Involuntary contractions that move food through digestive system

Bowel Movement (BM)

- Feces or stool
- Involves the movement of feces from the large intestines out of the body through the anus
- Semi-solid material made of water, solid waste, bacteria, and mucus

Digestive – 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 with active bowel sounds

Digestive – Changes Due to Aging (1)

- Decreased taste buds
- Slowing of peristalsis
- Slower absorption of nutrients
- Loss of bowel muscle tone
- Loss of sphincter muscle tone
- Digestion takes longer and less efficient
- Thinning of stomach lining

Digestive – Changes Due to Aging (2)

- Decrease in saliva
- Decrease in amount of digestive enzymes
- Decrease in appetite
- Loss of teeth
- Altered taste and smell
- Proteins, vitamins, and minerals not absorbed as well

Digestive – 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, pus, mucus, or other discharge in stool

Digestive – Variation of Normal (2)

- Nausea and vomiting
- Heartburn
- Diarrhea or constipation
- Pain when having a bowel movement
- Whitish, black, or red colored stool
- Incontinence

Gastric Ulcer and Gastritis

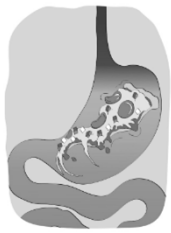
- Gastric (peptic) ulcers – raw sores in stomach caused by excessive acid secretion; can cause bleeding
- Gastritis – inflammation of the lining of the stomach

Ulcerative Colitis

- Chronic inflammatory disease of large intestine
- Serious condition that can result in a colostomy

Gastroesophageal Reflux Disease

- GERD; contents of stomach back up into esophagus; can damage lining of esophagus
- Heartburn most common symptom
- Nurse aide's role – evening meal eaten 3 to 4 hours before bedtime; remain upright 2 to 3 hours after eating; provide extra pillows



Constipation

- Occurs when stool moves too slowly through the intestine;
- Signs – abdominal swelling, gas, irritability, and verbalizing of resident that no recent bowel movement;
- Cause – can result from decreased fluid intake, poor diet, inactivity, medications, aging, certain diseases, or not taking the time to have a bowel movement

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 are not allowed to remove fecal impactions

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

Digestive – Nurse Aide's Role

- Make sure dentures are in place
- Observe for choking
- Provide fluids with meals
- Keep clean and dry
- Provide privacy and do not rush
- Encourage intake of fiber and fluids
- Regular physical activity
- Bowel habits for each resident is individual and personal
- Facilitate ideal position for elimination

Module H Body Systems

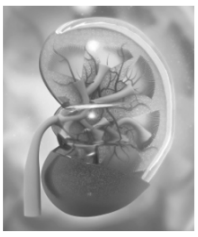
Urinary

Urinary – Overview

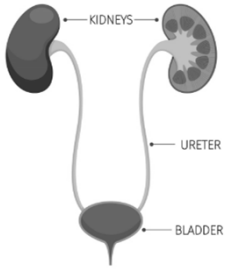
- Filtering system of the body
- Responsible for ridding body of waste products from blood

Kidneys – Structure and Function

- Bean-shaped paired organs
- Located at back of abdominal cavity, slightly above waist
- About four or five inches long; an inch thick
- Filters waste and produces urine
- Help maintain water balance and blood pressure
- Regulate electrolytes



Ureters and Bladder – Structure and Function

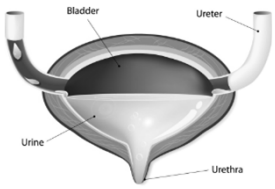


Ureters
- Narrow tubes
- Connect kidneys to urinary bladder
- About a foot long

Urinary bladder
- Muscular sac
- Stores urine until it passes

Urethra – Structure and Function

- A tube located between urinary bladder to the outside
- About seven or eight inches long in males
- About one and a half inches long in females

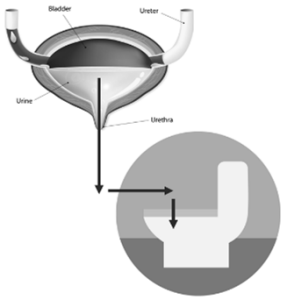


Urethra – Male Versus Female

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 (female urethra) versus seven/eight inches (male urethra) and how the male and female genitalia differ

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

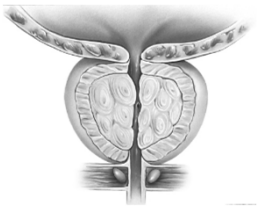


Urine – Normal Findings

Light yellow to amber in color
Clear
About 1000 to 1500 milliliters per day

Urinary – Changes Due to Aging

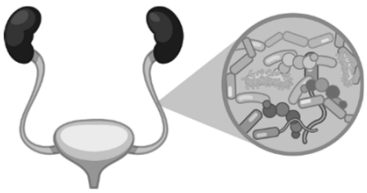
- **Decreased**
  - **Kidney size and ability to filter blood**
  - **Capacity, elasticity, muscle tone of bladder**
  - **Ability to concentrate urine**
- **Difficulty or incomplete emptying of urinary bladder**
- **Enlargement of prostate in males**



Urinary – Variation of Normal

- Changes in urine
- Weight loss or gain
- Swelling in arms or legs
- Dysuria
- Swelling in bladder or abdomen
- Pain in kidney or back
- Incontinence
- Fever

Urinary Tract Infection

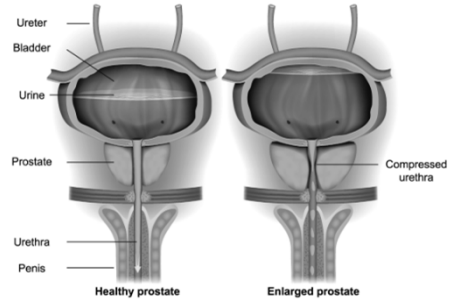


- An infection of urethra, bladder, ureter, or kidney typically caused by E. coli, a bacteria found in the digestive system
- More common in females

Kidney Stones (Renal Calculi)

- Form when urine crystallizes in kidneys
- Can block kidneys and ureters causing excruciating pain
- Abdominal or back pain, painful urination, frequent urination, blood in urine, nausea, vomiting, chills, fever
- Strain urine

Benign Prostatic Hypertrophy (BPH)

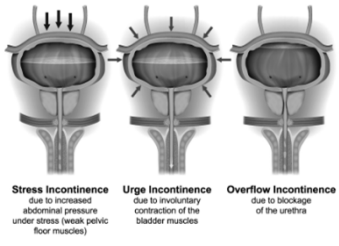


Chronic Kidney Disease (CKD)

- **Lasting damage of kidneys that worsens gradually; 5 stages; with the latter stages resulting in the need for dialysis**
- **Can be prevented from advancing into further stages**
- **Dialysis machine picture on slide**

Urinary Incontinence

Inability to control bladder leading to an involuntary loss of urine; not normal part of aging



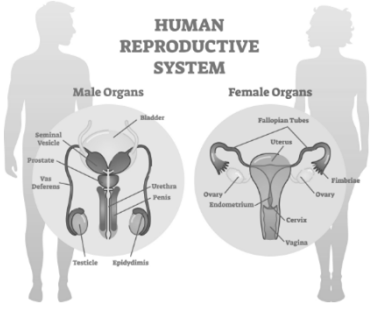
Urination – Nurse Aide's Role

- Residents with incontinence must be kept clean and dry
- Provide privacy; should not be rushed or interrupted
- Encourage residents to drink fluids often
- Ideal position for urination for men is standing; for women is a sitting position

Module H Body Systems

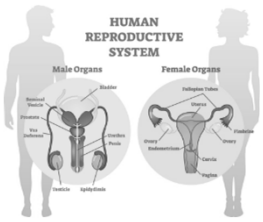
Reproductive

Reproductive System

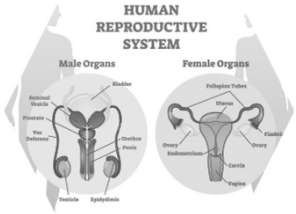


Reproductive – Overview

- This system allows human beings to create a new human life; may be subdivided into two categories
  1) The female reproductive system
  2) The male reproductive system



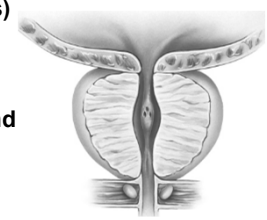
Reproductive – Structure and Function



Responsible for production of reproductive cells, production of hormones responsible for sex characteristics, and reproduction

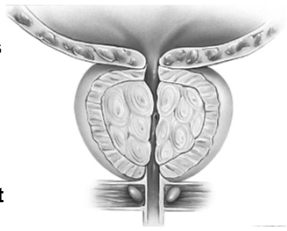
Reproductive – Normal Findings

- Absence of bleeding (other than menses) and vaginal discharge/penile discharge
- Absence of pain and itching
- Absence of enlargement of prostate gland

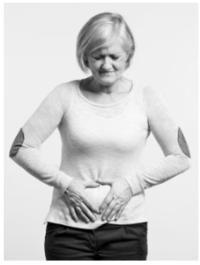


Reproductive – Changes Due to Aging

- Decreased size and function of reproductive structures
- Enlargement of prostate
- Sagging breasts
- Loss of hair in vulva area
- Weakened muscles that hold female reproductive organs in place



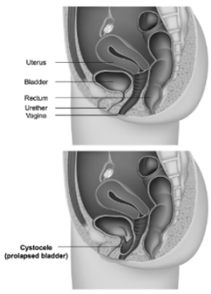
Reproductive – Variation of Normal



- Bleeding other than menses
- Pain
- Vaginal/penile discharge
- Itching

Pelvic Organ Prolapse

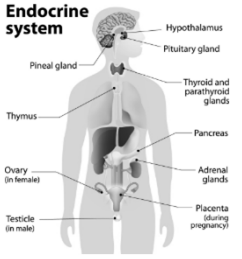
- Female reproductive organs held in place by muscles and connective tissue; pelvic organs may drop down (prolapse) into vaginal canal
- Cystocele – when bladder drops down (pictured)
- Incontinence may occur
- Nurse aide's role – provide perineal care and report abnormal observations



Module H Body Systems

Endocrine

Endocrine – Overview



- Is a system of glands that secrete chemicals directly into the bloodstream to regulate body functions
- Different types of glands are pictured on slide

Endocrine – Structure and Function

- Structure – glands located throughout the body that secrete hormones
- Function
  - Maintains homeostasis (balance)
  - Influences growth and development
  - Regulates sugar in the blood and calcium in the bones
  - Regulates reproduction
  - Regulates how fast cells burn food

Endocrine

Normal findings
- Skin warm/dry
- No variation of weight, appetite, urination from typical
- Awake, alert, oriented

Changes due to aging
- Levels of hormones decrease
- Insulin production decreases
- Body is less capable to deal with stress

Endocrine – Blurred Vision

Endocrine – Variation of Normal (1)

- Headache
- Blurred vision
- Dizziness
- Weakness
- Hunger
- Irritability
- Sweating
- Dry skin

Endocrine – Variation of Normal (2)

Confusion
Weight gain/loss
Appetite increase/decrease
Tiredness
Increase thirst
Increase urination

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, sugar builds up in blood, causing blood glucose levels to rise

Diabetes – Three Types

- Type 1 – onset typically during childhood and early adult; pancreas does not produce insulin; lifelong condition; managed with daily doses of 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; usually controlled by diet and oral medicine
- 3rd type is gestational diabetes and occurs during pregnancy

Diabetes – Nurse Aide's Role

- Ensure meals are served and resident eats his diet, report to nurse if resident refuses meal, observe intake of meal and document
- Encourage resident to follow exercise program
- Observe for signs of low blood sugar (hypoglycemia) and high blood sugar (hyperglycemia); report immediately to nurse
- Provide for foot care as directed and observe for irritation or sores, report immediately to nurse

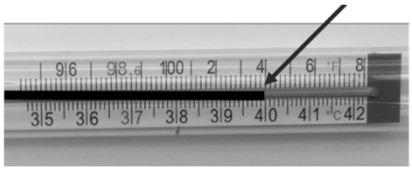
Module H Body Systems

Immune

Immune System

- Defends threats both inside and outside the body
- Structure – antibodies and white blood cells
- Function
  - Protects body from harmful infection-causing germs,
  - Provides immunity from certain diseases
- Changes due to aging
  - Immune system weakens; more prone to getting infections
  - Immune system may attack itself causing disease

Immune – Variation of Normal

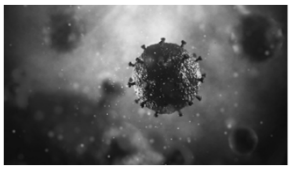


- Signs of infection
- Anxiety
- Nausea and vomiting
- Stiff, swollen, painful joints

Acquired Immune Deficiency Syndrome

(AIDS) Disease caused by a virus, HIV and attacks the immune system and destroys infection-fighting and cancer-fighting cells of the body

Spread through body fluids including blood, semen, vaginal secretions, and breast milk



AIDS – Nurse Aide's Role

- Follow Standard Precautions and Blood Borne Pathogen Standard
- 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
- Observe for and report signs of infection
- Provide emotional support

Other Common Disorders

- **Lupus – when 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**
- **Nurse aide's role**
  - **Observe for and report signs of infection**
  - **Provide for nutrition, hydration, and rest for the resident**

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