MODULE H
Body Systems

Objectives

- Identify the structure and function of the cell and the integumentary, musculoskeletal, neurological, cardiovascular, respiratory, gastrointestinal, urinary, reproductive, endocrine, and immune systems.
- Describe the nurse aide's role in the provision of care for a resident with cancer.
- Discuss changes in the integumentary, musculoskeletal, neurological, cardiovascular, respiratory, gastrointestinal, urinary, reproductive, endocrine, and immune systems due to aging.

Objectives

- Compare and contrast normal findings and variation of normal findings of the integumentary, musculoskeletal, neurological, cardiovascular, respiratory, gastrointestinal, urinary, reproductive, endocrine, and immune systems.
- Describe common disorders of the integumentary, musculoskeletal, neurological, cardiovascular, respiratory, gastrointestinal, urinary, reproductive, endocrine, and immune systems.
Objectives

- Describe the nurse aide’s role related to a resident’s integumentary, musculoskeletal, neurological, cardiovascular, respiratory, gastrointestinal, urinary, reproductive, endocrine, and immune systems.

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MODULE H
Cell Theory

Overview

Basic unit of all living tissues or organisms
Structure and Function

Cells
- Building blocks of human body
- Microscopic
- Combine to form tissue

Tissue
- Carry out a particular activity or function
- Grouped together to form organs
- Cell + cell + cell + cell = tissue

Organ
- Tissue + tissue + tissue + tissue =
- Carries out a particular function
- Some are single and some are paired
- Combine to form a system

Structure and Function
Structure and Function

System
- Organs function together for a specific purpose or purposes
- Systems of the human body?
- Combine to form an organism

Organ + organ + organ + organ =

Organism

System + system + system

Made up of systems that function together to perform activities of daily living needed for continued life

Variation of Normal

Human organisms may have problems at the cellular level, but show signs outside of body. Examples?
Common Disorders

- Tumor – group of abnormally-growing cells; benign or malignant
- Cancer (CA) – abnormal cells grow in an uncontrolled manner, invade surrounding tissue and may spread to other areas of the body

Nurse Aide’s Role

- Should understand basic cellular theory
- Assist with care directed toward symptoms of cancer or treatment
- Offer emotional support
- Be aware of warning signs of cancer, CAUTION

- Change in bowel or bladder habits
- A sore that does not heal
- Unusual bleeding or discharge
- Thickening or lump
- Indigestion or difficulty swallowing
- Obvious change in wart or mole
- Nagging cough or hoarseness
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MODULE H
Integumentary

Overview

- The skin
- The LARGEST organ and system in the body
- Responsible for providing a natural protective covering of the body

Structure

- Three layers – epidermis, dermis, subcutaneous tissue
- Accessory structures
### Function
- Protects body
- Regulates temperature
- Eliminates waste
- Contains nerve endings
- Stores fat and vitamins

### Normal Findings
- Warm, dry
- Absence of breaks, rash, discoloration, swelling

### Changes Due to Aging
- Skin is thinner, drier, more fragile
- Skin loses elasticity
- Fatty layer ↓
- Hair thins and may gray
Changes Due to Aging

- Folds, lines, wrinkles and brown spots
- Nails harden and more brittle
- " cake circulation to skin
- Development of skin tags, warts and moles

Variation of Normal

- Breaks in skin
- Rash, itching, or skin discoloration
- Pale, white, or reddened areas
- Blue and black areas

Variation of Normal

- Dry or flaking skin
- Ulcers, sores, or lesions
- Swelling
- Drainage
- Abnormal temperature
- Changes in scalp or hair
Common Disorders

- Eczema
- Dermatitis
- Tears and abrasions
- Pressure ulcers

Nurse Aide’s Role

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MODULE H
Musculoskeletal
Overview
Provides structure and movement

Structure and Function

The Skeleton
- Has 206 bones
- Framework

The Bones
- Hard and rigid outside
- Soft and spongy inside
- Are connected to other bones
- Allows body to move
- Protects organs
- Stores calcium
- Makes and stores blood cells

Muscles
- Voluntary or involuntarily
- Over 600
- Some connected to bones
- Help body stay erect
- Produce heat
- Give body form
- Movement
Structure and Function

JOINTS

- Point where bones meet
- Made up of cartilage and connective tissue
- May be movable, slightly movable or immovable
- Allows for movement in the area

Normal Findings

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

Abduction
Adduction

Extension – Arm

Flexion – Arm
Extension - Leg

Flexion - Leg

Pronation
Supination

Dorsiflexion

Plantar Flexion
Changes Due to Aging

- Muscles weaken
- Bones lose density
- Joints stiffen, become less flexible and painful
- Height dow
- Slowed recovery
- "It hurts when I move"
- Reaction time, movement speed, agility and endurance
- Poorer response to stimuli
- Muscle and nerve interaction

Variation of Normal

- History of falls
- Difficulty holding or lifting
- Muscle strength and tone
- Generalized weakness
- Bruising
- White, shiny, red, or warm areas over a joint
**Variation of Normal**

- Slow and unsteady movement
- "I have pain in my joints"
- "I have pain in my muscles"
- "It hurts when I move"
- Inability to move joints

**Common Disorders**

- **Muscle atrophy**
  - Decreased size in muscle mass
  - Contracture
  - Muscle strain
  - Sprain
  - Osteoporosis

**Common Disorders**

- Fracture
- Arthritis (osteoarthritis and rheumatoid arthritis)
- Amputation
Nurse Aide’s Role

- Prevent falls
- Encourage regular movement, activity and self-care
- Encourage walking, light exercise and active range of motion

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MODULE H
Neurological

Overview

Also called the nervous system

The control and message center of the body

Senses and responds to changes
Structure and Function

Brain
Located in the skull and consists of three parts
- Cerebrum
- Cerebellum
- Brainstem

Spinal Cord
- Located within the spine
- Connected to the brain
- Conducts messages

Nerves
- Are made up of nerve cells
- Carry messages to and from the brain and to and from the rest of the body

Sensory Organs
Receive impulses from environment and relay to brain
Normal Findings

Where did they say I was and how did I get here?

Changes Due to Aging

Variation of Normal

- Jerking motions or tremors
- Changes in gait or movement
- Speech, vision, or hearing changes
- “I have numbness and feel dizzy and nauseated”
I am sooooo confused. Why are those 3 stars floating around my head?

Common Disorders
- CVA (or stroke)
- Head or spinal cord injuries
- Dementia
- Parkinson’s disease
- Hearing loss/deafness
- Cataract/glaucoma/blindness
- Otitis media

Nurse Aide’s Role
Mrs. Smith, today is Tuesday and you are in Happy View Nursing Home.
Overview

Also called the circulatory system and is the continuous movement of blood though the body.

Structure and Function

Heart
- The pump of the cardiovascular system
- About the size of a closed fist
- Consists of 4 chambers
- Has 2 phases
- Pulse is.........................
Structure and Function

Blood Vessels
- Arteries carry blood with oxygen and nutrients away from the heart and to the cells
- Veins carry blood with waste products away from the cells and to the heart

Blood
- Adult has 5 to 6 quarts
- What does it consist of?

Normal Findings
- Pulse rate of 60 to 100 beats per minute, regular and strong
- Blood pressure of systolic 100 – 139, and diastolic 60 – 89

Changes Due to Aging
- Heart muscle ↓ efficient
- Blood pumps with ↓ force
- Arteries lose elasticity and become narrow
- Blood pressure ↑
Variation of Normal
- Change in pulse rate and rhythm
- Weakness and tiredness
- Loss of ability to perform ADLs
- Swelling of hands and feet
- Pale or bluish lips, hands, or feet
- Weight
- "My chest hurts"
- Shortness of breath, changes in or difficulty breathing

Common Disorders
- Coronary Artery Disease (CAD)
- Congestive Heart Failure (CHF)
- Myocardial Infarction (MI, "heart attack")
- Anemia
- Varicose veins
- Hypertension
- 180
- 110

Nurse Aide’s Role
- Provide rest periods
- Encourage exercise, movement; and range of motion, when inactive
- Prevent tiring
- Layer clothing
 MODULE H  
Respiratory

Overview

- Involves breathing in oxygen and
- Breathing out carbon dioxide

Structure and Function

- Thorax
  - Closed cavity that contains the structures needed for respiration
  - Extends from base of neck to diaphragm

- Upper Respiratory Tract
  - Nose, mouth, sinuses, pharynx, larynx & top of trachea

- Lower Respiratory Tract
  - Lower trachea, bronchi & lungs
Structure and Function

Lungs

- Elastic, spongy, cone-shaped air-filled structures
- Process of breathing in
- Process of breathing out

Normal Findings

- Rate of 12 to 20 breaths per minute
- Character is quiet, even and without effort

Changes Due to Aging

- Weakening in respiratory muscles
- Gradual decrease in elasticity of lung tissue
- Shortness of breath with activity
- Decreased lung capacity
- Decrease in oxygen in blood
- Weakening in diaphragm
- Limited expansion of chest
**Variation of Normal**

- Shallow breathing or through pursed lips
- Coughing or wheezing
- Nasal congestion or discharge, or productive cough
- Noisy respirations
- Gasping

**Variation of Normal**

- Cyanosis
- Dyspnea
- Changes in rate and rhythm
- Need to sit after mild exertion
- "My chest hurts"

**Common Disorders**

- Chronic Obstructive Pulmonary Disease (COPD)
- Pneumonia
- Emphysema
- Influenza
- Asthma
Nurse Aide’s Role

- Provide rest periods
- Encourage exercise and regular movement
- Encourage/assist with deep breathing
- Limit exposure
- Position residents

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MODULE H
Gastrointestinal

Overview

Also known as the digestive system and extends from the mouth to the anus

Has 2 functions: digestion and elimination
Structure and Function

Upper GI Structures

{ Digests food, absorbs nutrients and eliminates waste }

Lower GI Structures

Accessory Structures

Normal Findings

- Adequate intake
- Passage of a brown, soft, formed, tubular shaped stool, without pain
- Flat abdomen

Changes Due to Aging

- ↓ number of taste buds
- ↓ of peristalsis
- ↓ absorption of nutrients
- Loss of bowel muscle tone
- Loss of sphincter muscle tone
Changes Due to Aging

- ↓ in saliva
- ↓ in digestive enzymes and saliva
- ↓ appetite
- Loss of teeth
- Altered taste and smell

Variation of Normal

- Difficulty swallowing or chewing
- Poor intake of diet and fluids
- Weight ↓ or ↑
- Loss of appetite

Variation of Normal

- “My abdomen hurts”
- Cramping
- Nausea and vomiting
- Heartburn
- Diarrhea
- Constipation
Variation of Normal

- "It hurts when I have a bowel movement"
- Whitish, black, or red colored stool
- Blood, pus, mucus, or other discharge
- Incontinence

Common Disorders

- Ulcer
- Hemorrhoids
- Constipation
- Diarrhea
- Gastroenteritis

Nurse Aide’s Role

- Encourage intake of fluids and nutritional meals
- Make mealtime enjoyable and allow time to eat
- Provide oral care before and after meals
Nurse Aide’s Role

Overview

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

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MODULE H
Urinary
**Structure and Function**

**Kidneys**
- Bean-shaped, paired organs
- Located at back or abdominal cavity, slightly above waist
- About 4 or 5 inches long and 1 inch thick
- Filter waste products and produces urine
- Help maintain water balance and blood pressure
- Regulate electrolytes

**Ureters**
- Narrow tubes
- Connect kidneys to bladder
- About 1 foot long

**Urinary Bladder**
- Muscular sac
- Stores urine until it passes from body

**Urethra**
- A tube
- Located between bladder and outside of body
- About 7 or 8 inches long in males and about 1.5 inches long in females
Structure and Function

Urine
- Made up of water, salt & waste

Normal Findings of Urine
- Pale yellow to amber in color
- Clear

About 1000 to 1500 milliliters per day

Changes Due to Aging
- Decrease in kidney size and ability to filter
- Decrease in ability to concentrate urine
- Decrease in capacity, elasticity, muscle tone of bladder
- Difficulty or incomplete emptying of bladder
- Prostate enlargement in males
Variation of Normal

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

Common Disorders

- Nephritis
- Cystitis
- Calculi
- Kidney failure
- Urinary incontinence
- UTI
- Retention
- Hematuria
- Dysuria

Urinary System – Nurse Aide’s Role

- Encourage fluids, unless restricted
- Offer assistance to bathroom
- Keep residents clean and dry
MODULE H
Reproductive

Overview
Allows human beings to create a new human life
1. The female reproductive system
2. The male reproductive system

Structure & Function
Female reproductive structures
Male reproductive structures
Responsible for production of reproductive cells, produce hormones responsible for sex characteristics and reproduction
Normal Findings

- Absence of bleeding and discharge
- Absence of pain and itching
- Absence of enlargement of prostate

Changes Due to Aging

- ↓ size and function of reproductive structures
- ↑ size of prostate
- Sagging breasts
- Loss of hair in vulva area

Variation of Normal

- Bleeding
- Pain
- Discharge
- Itching
Common Disorders

- Cystocele
- Prostatic hypertrophy

Nurse Aide’s Role

- Encourage proper nutrition and fluid intake
- Try to minimize stressors

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MODULE H
Endocrine
Overview

Is a system of glands that secrete chemicals directly into the bloodstream to regulate body functions

Structure and Function

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

Endocrine System – Normal Findings

- Skin warm/dry
- No variation of weight, appetite, urination from typical
- Awake, alert, oriented
Changes Due to Aging

- Decreased levels of hormones
- Decreased insulin production
- Body less capable to deal with stress

Variation of Normal

- Headache, blurred vision, dizziness
- Weakness
- Hunger
- Irritability
- Sweating
- Dry skin

Endocrine System – Variation of Normal

- Confusion
- Gain or lose weight
- Gain or lose appetite
- Tiredness
- Increased thirst
- Increased urination
Common Disorders
- Diabetes Mellitus
- Hyper- and hypothyroidism

Nurse Aide’s Role
- Encourage proper nutrition and fluid intake
- Try to ↓ stressors

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MODULE H
Immune System

Immune System
- Overview – defends the body
- Structure and function – antibodies and white blood cells that protect the body and provides immunity
- Normal findings – body can fight infection
- Changes due to aging – immune system weakens or may attack self
Immune System

- Variation of normal – signs of infection, anxiety, nausea and vomiting, stiff/swollen/painful joints
- Common disorders – AIDS, lupus, graves disease
- Nurse aide’s role – observe and report, plus.........

The End