

# **N.C. Nurse Aide I Curriculum**

## **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.

# **N.C. Nurse Aide I Curriculum**

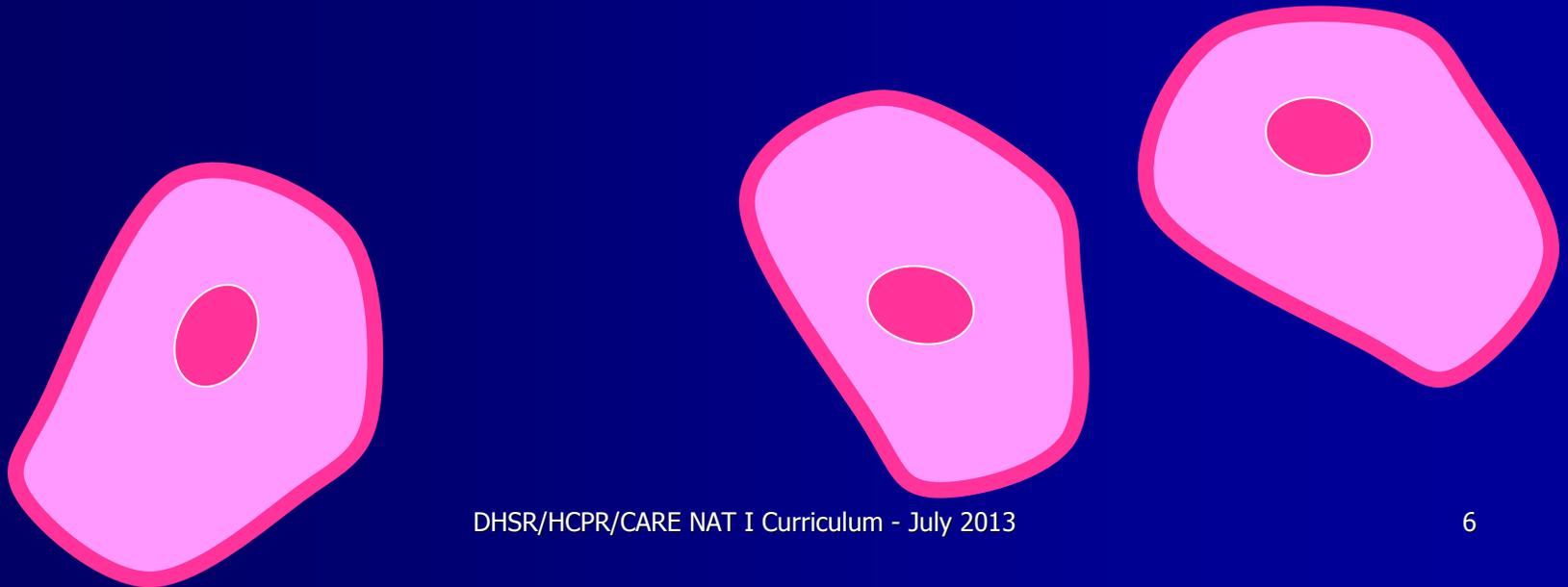
## **MODULE H**

### **Cell Theory**



# Overview

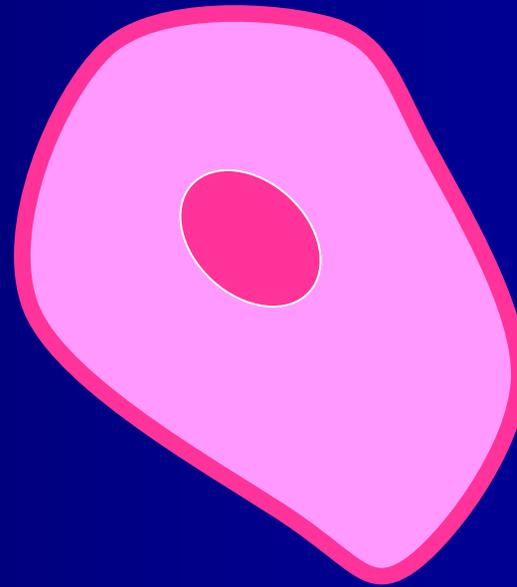
Basic unit of all living  
tissues or organisms



# Structure and Function

## Cells

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



# Structure and Function

## Tissue

- Carry out a particular activity or function
- Grouped together to form organs

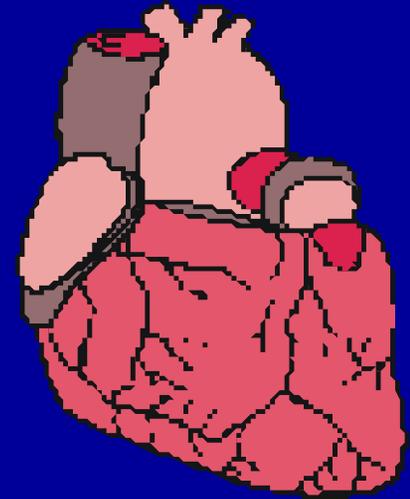


**Cell + cell + cell + cell = tissue**

# Organ

**Tissue + tissue + tissue + tissue =**

- **Carries out a particular function**
- **Some are single and some are paired**
- **Combine to form a system**



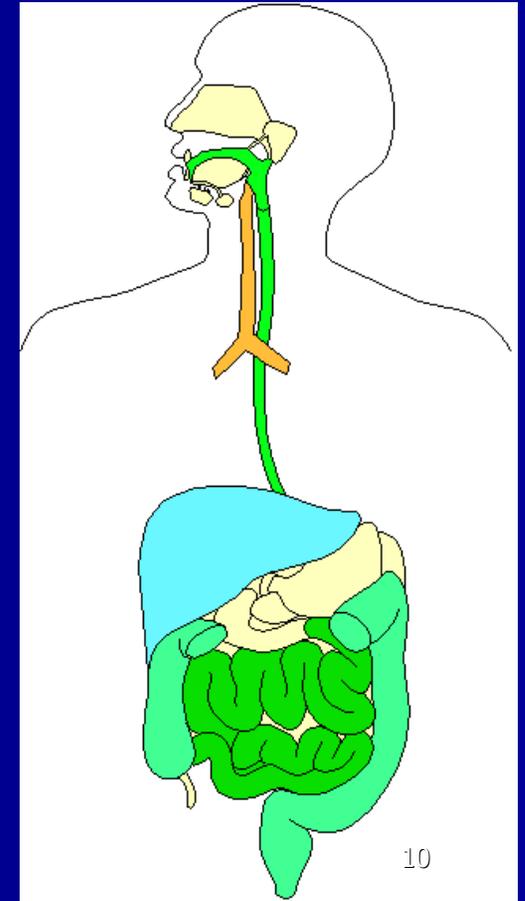
## Structure and Function

# 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 =**





**System + system + system  
equal an**

# Organism

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



## Structure & Function

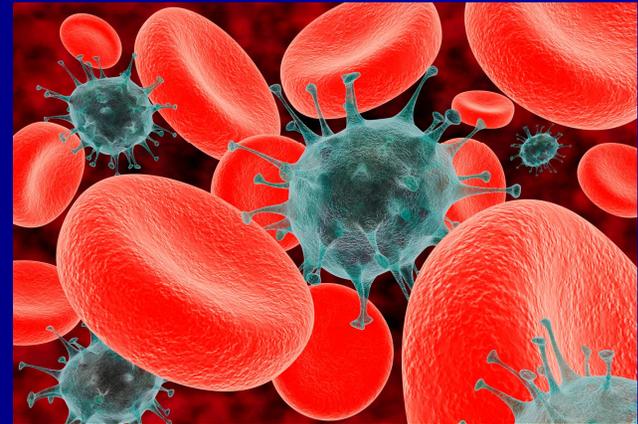
# Variation of Normal



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**

# **N.C. Nurse Aide I Curriculum**

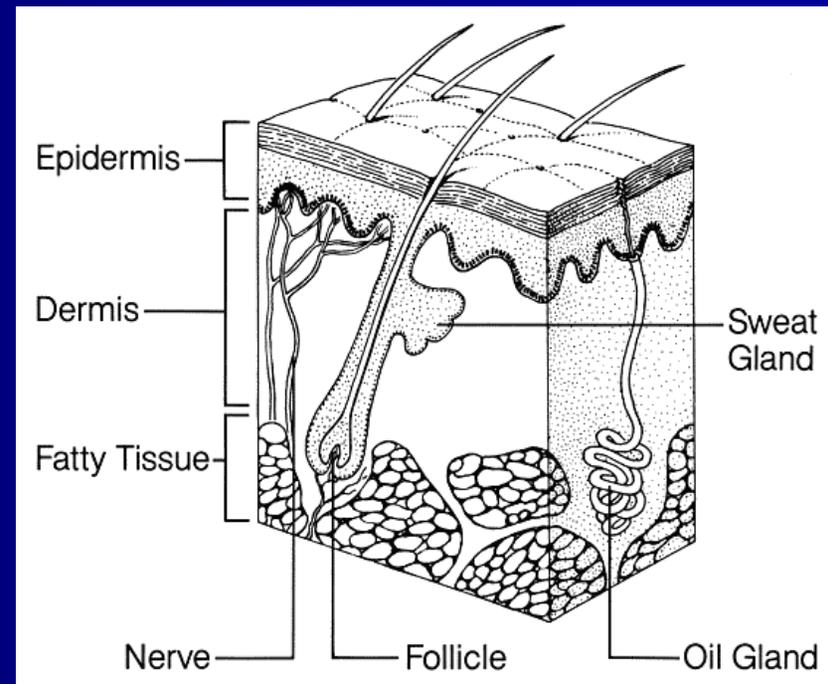
## **MODULE H** **Integumentary**

# Overview

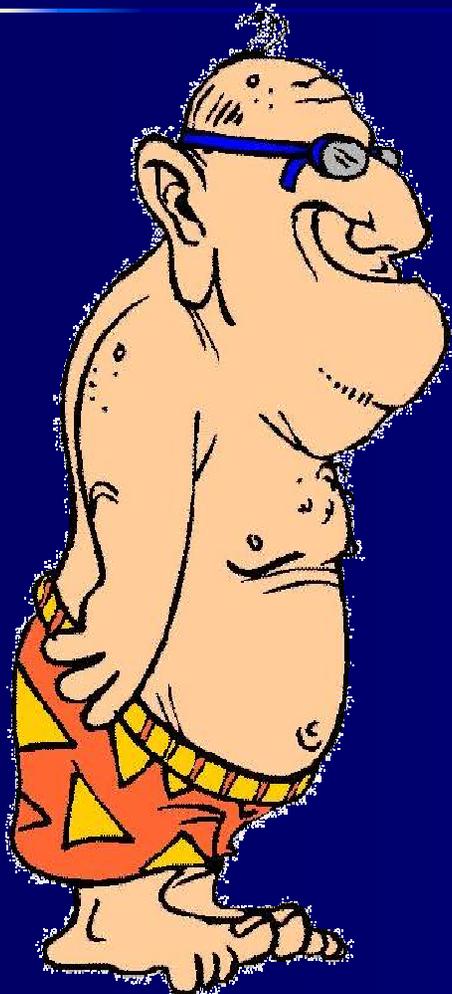
- The skin
- The **LARGEST** organ and system in the body
- Responsible for providing a natural protective covering of the body

# 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
- ↓ circulation to skin
- Development of skin tags, warts and moles

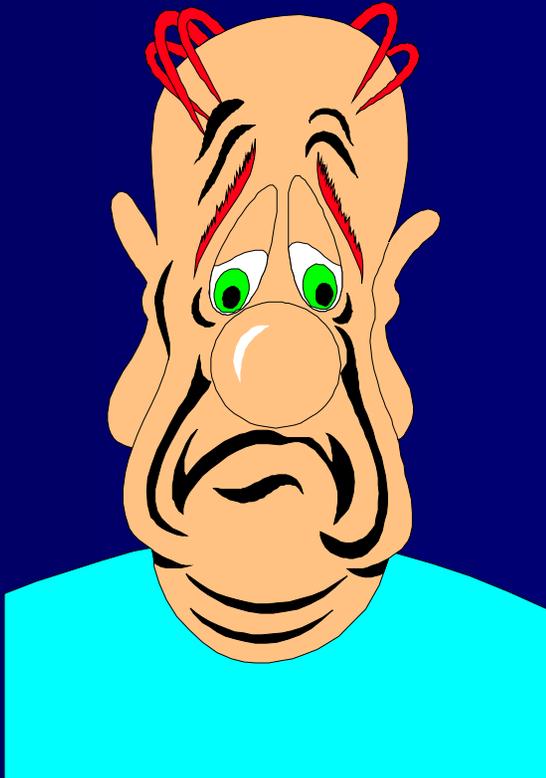


- Breaks in skin
- Rash, itching, or skin discoloration
- Pale, white, or reddened areas
- Blue and black areas



## Variation of Normal

# 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



# **N.C. Nurse Aide I Curriculum**

## **MODULE H**

### **Musculoskeletal**

# Overview

Provides structure and movement



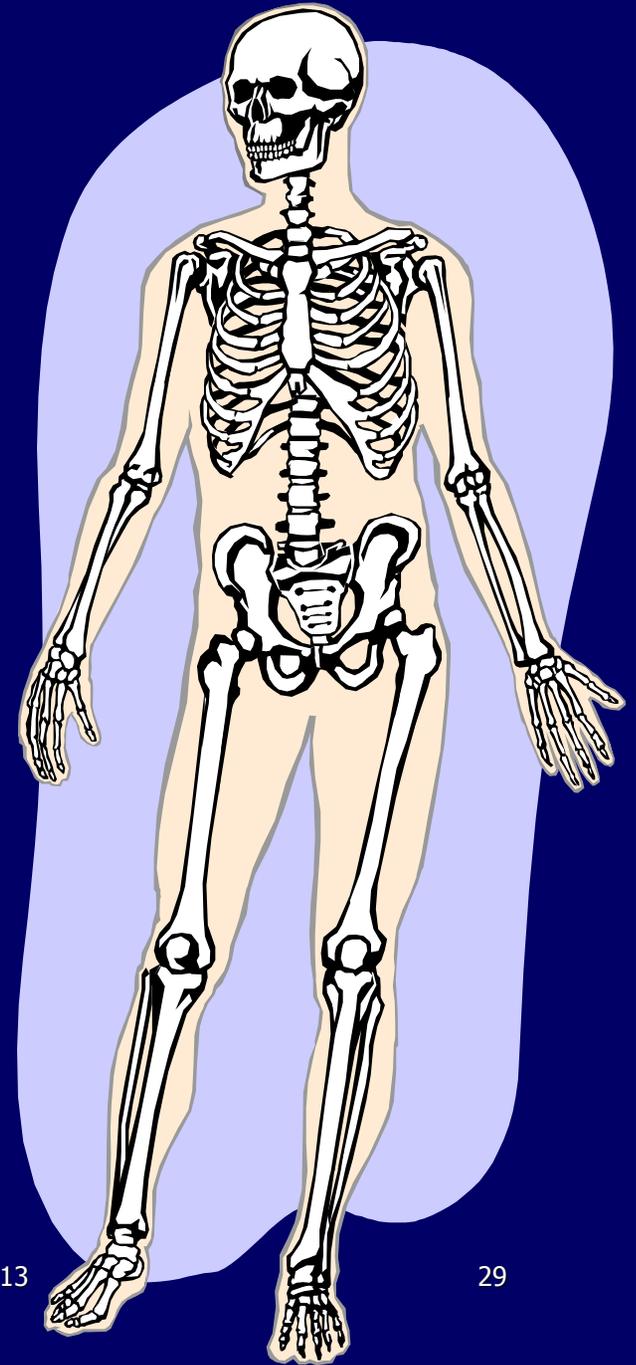
# Structure and Function

## The Skeleton

- Has 206 bones
- Framework

## The Bones

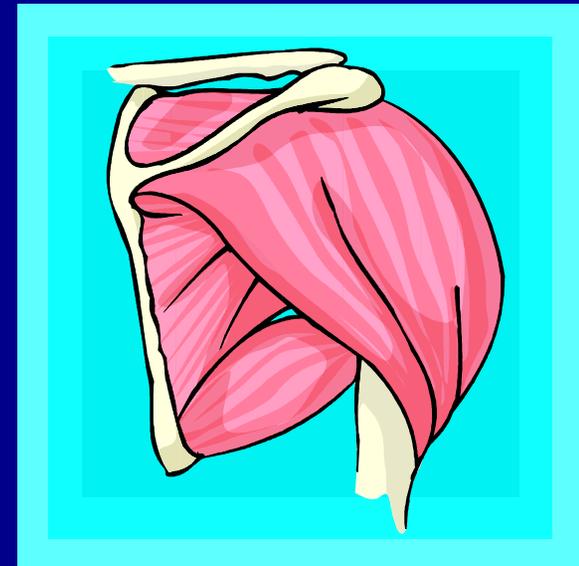
- Hard and rigid outside
- Soft and spongy inside
- Are connected to other bones
- Allows body to move
- Protects organs
- Stores calcium
- Makes and stores blood cells



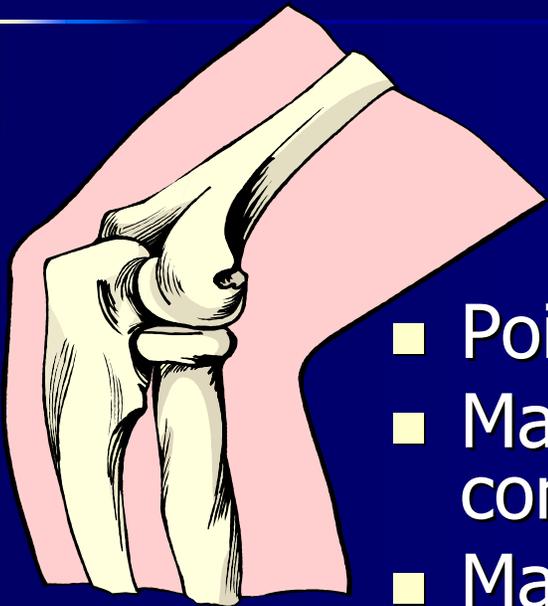
# Structure and Function

## Muscles

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



# Structure and Function



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

# JOI NTS

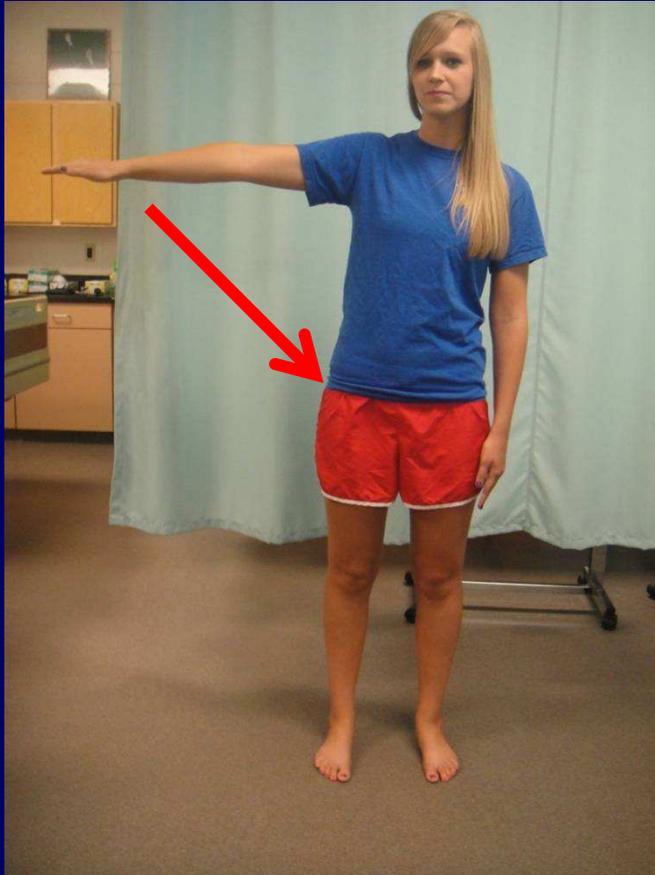
# Normal Findings



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



# Abduction



# Adduction



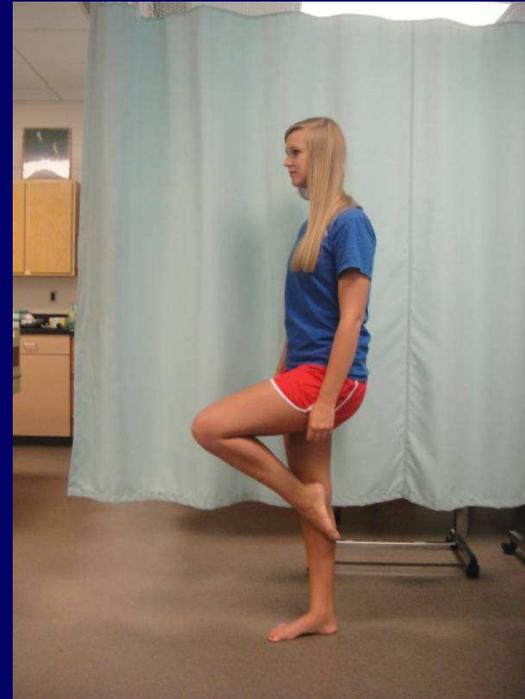
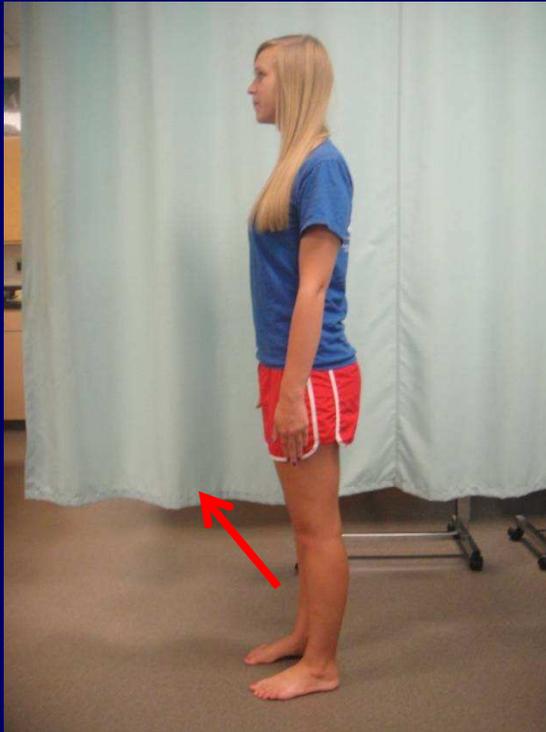
# Extension – Arm



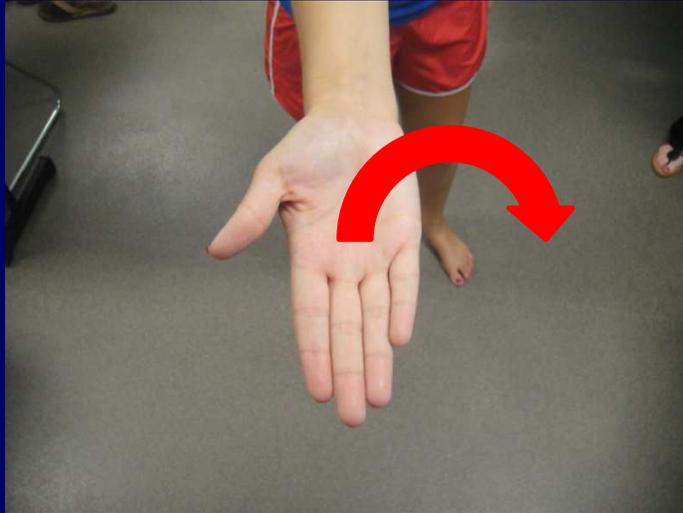
# Flexion – Arm



# Extension - Leg



# Flexion - Leg



# Pronation



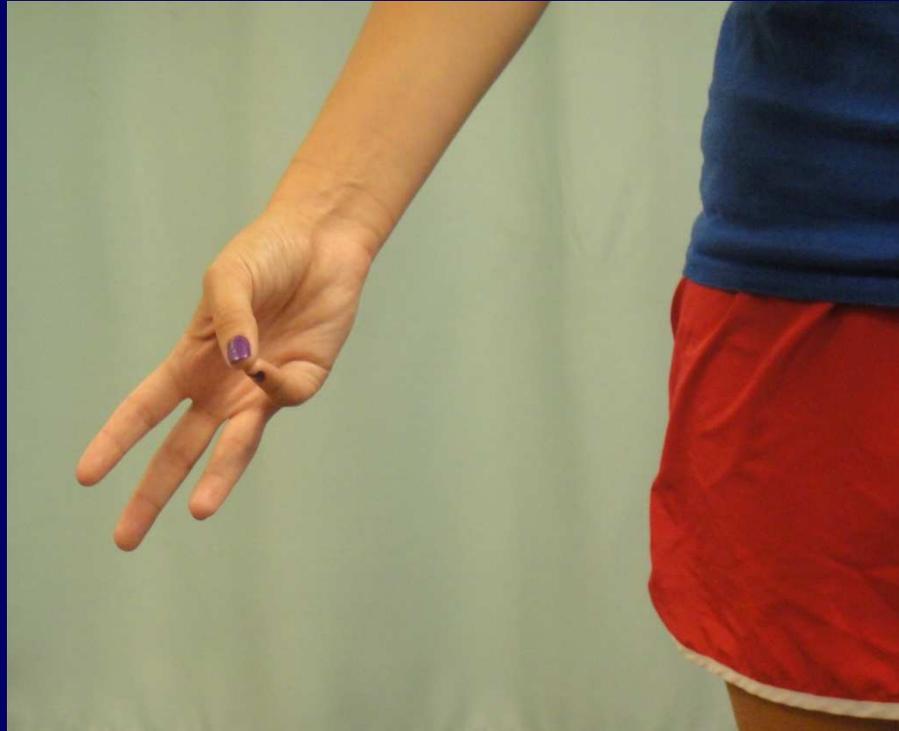
# Supination



# Dorsiflexion



# Plantar Flexion



# Opposition

# Changes Due to Aging

- Muscles weaken
- Bones lose density
- Joints stiffen, become less flexible and painful
- Height ↓
- 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

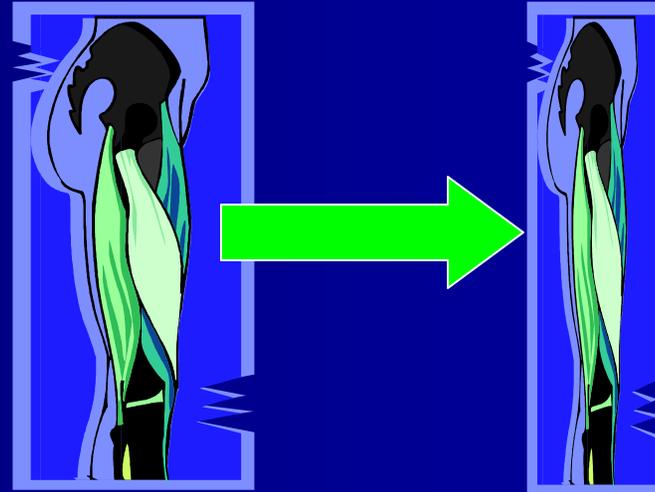


# Common Disorders

## Muscle atrophy

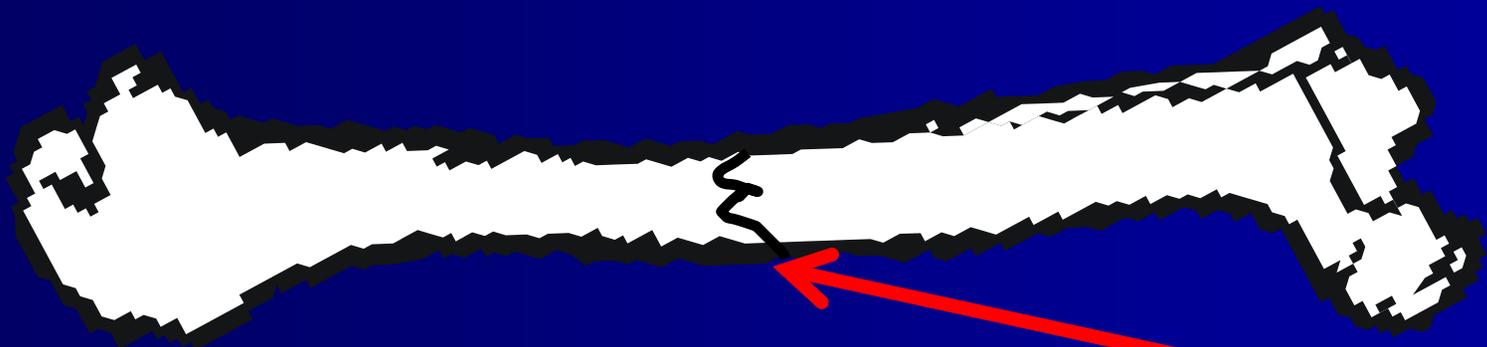
↓ size in muscle mass

- 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

# **N.C. Nurse Aide I Curriculum**

## **MODULE H**

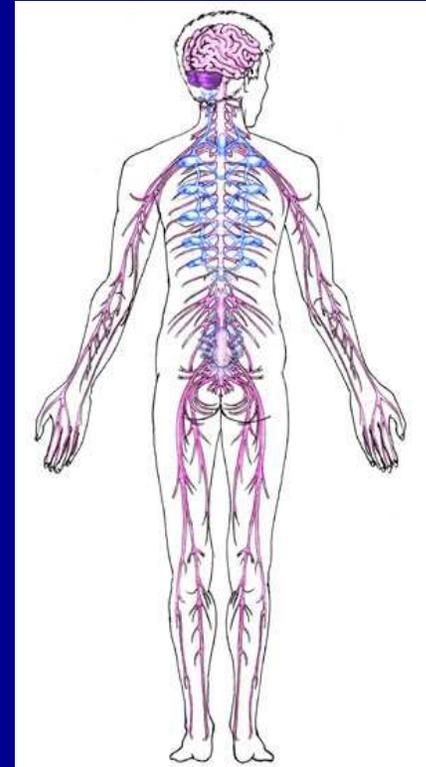
### **Neurological**

# Overview

Also called the nervous system

The control and  
message center of  
the body

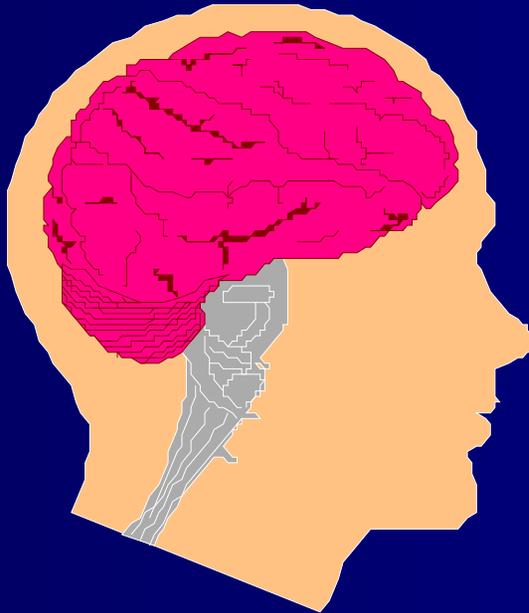
Senses and responds to  
changes



# Structure and Function

## Brain

Located in the skull and consists of three parts



- Cerebrum
- Cerebellum
- Brainstem

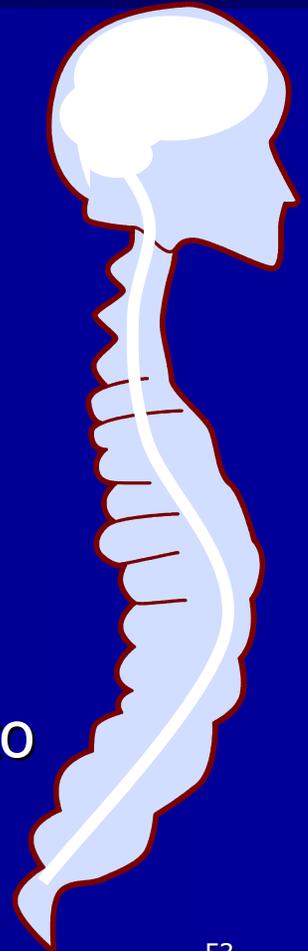
# Structure and Function

## Spinal Cord

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

## Nerves

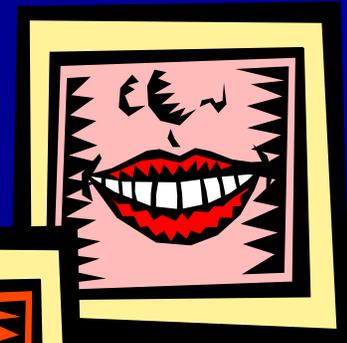
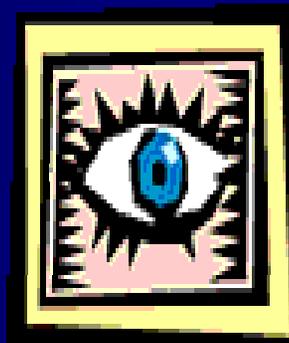
- Are made up of nerve cells
- Carry messages to and from the brain and to and from the rest of the body



# Structure and Function

## 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**

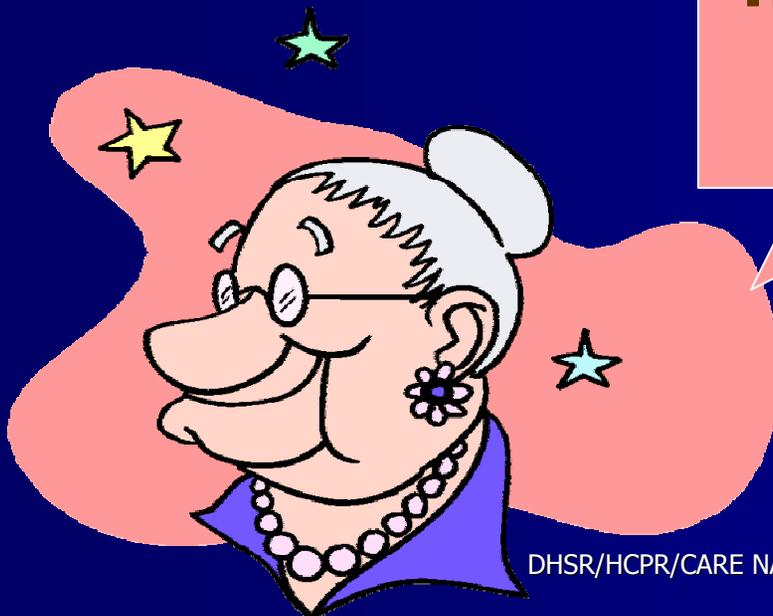
# Variation of Normal

- Jerking motions or tremors
- Changes in gait or movement
- Speech, vision, or hearing changes
- "I have numbness and feel dizzy and nauseated"



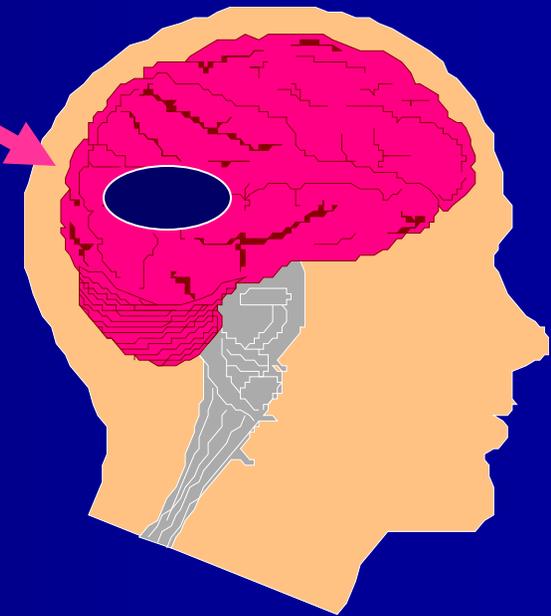
# Variation of Normal

**"I am soooooo confused. Why are those 3 stars floating around my head?"**



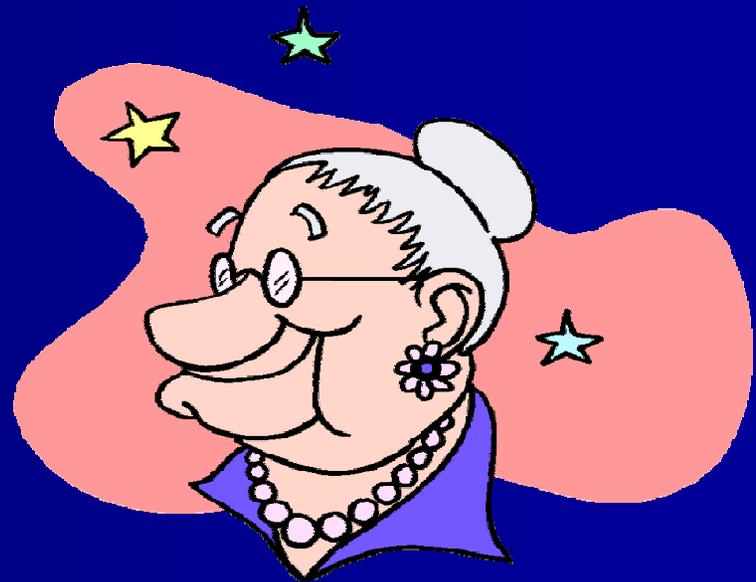
# Common Disorders

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



# Nurse Aide's Role

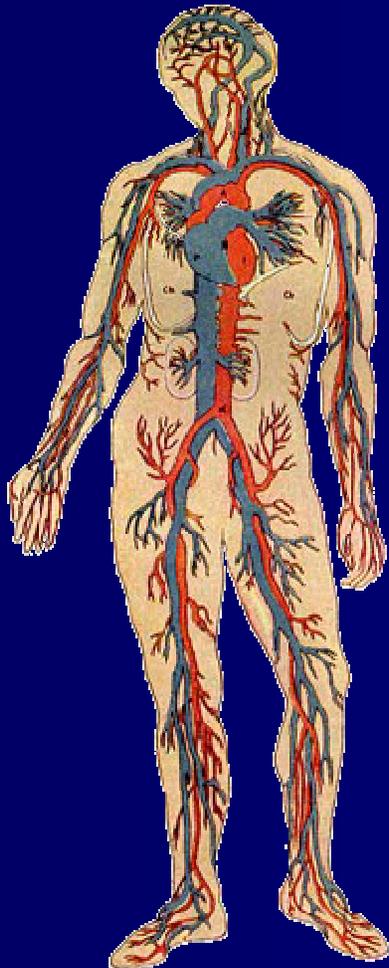
**Mrs. Smith, today is Tuesday and you are in Happy View Nursing Home.**



# **N.C. Nurse Aide I Curriculum**

## **MODULE H** **Cardiovascular**

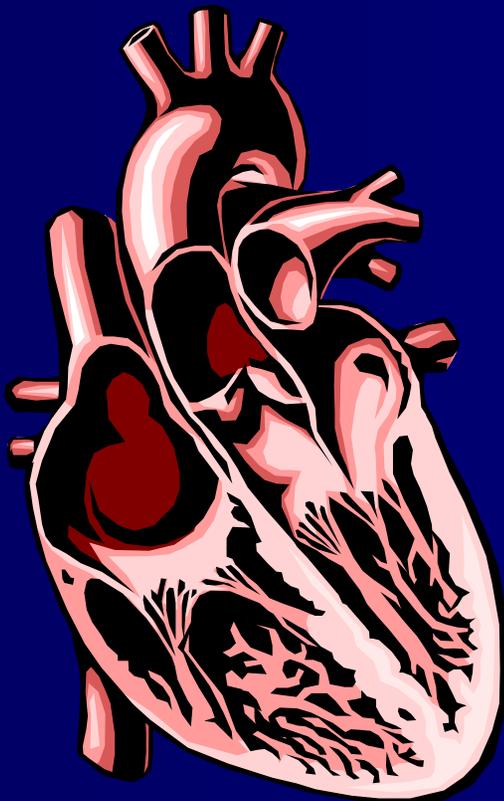
# Overview



Also called the circulatory system and is the continuous movement of blood through 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

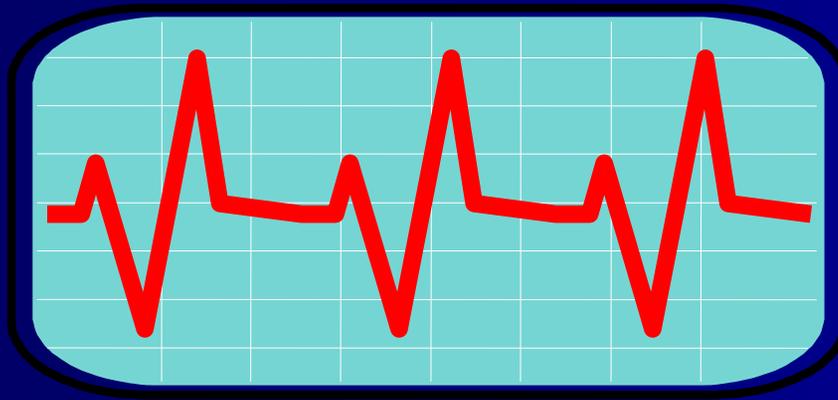
- Arteries carry blood with oxygen and nutrients away from the heart and to the cells
- Veins carry blood with waste products away from the cells and to the heart

## Blood

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



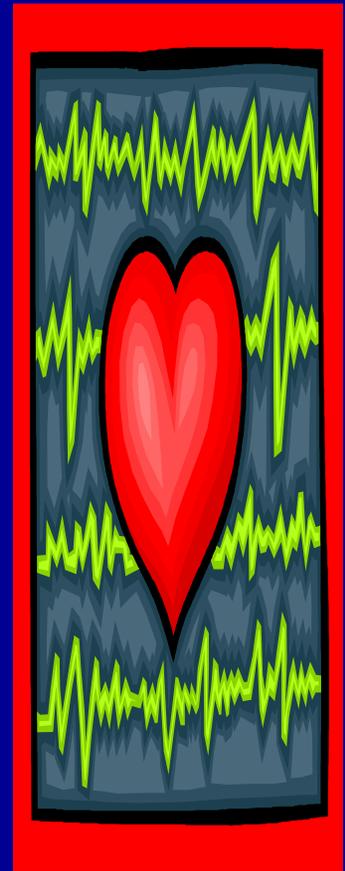
# Normal Findings



- 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

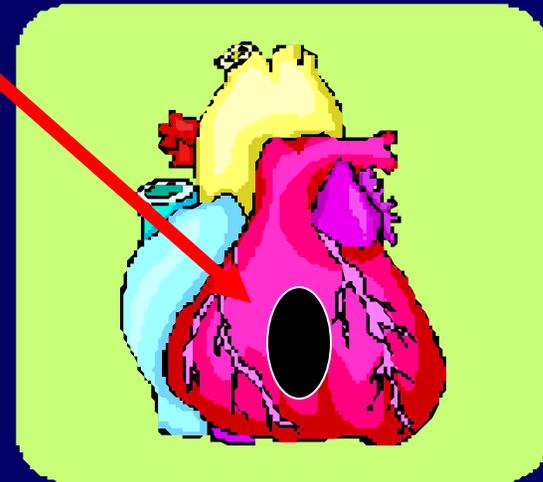
- Change in pulse rate and rhythm
- Weakness and tiredness
- Loss of ability to perform ADLs
- Swelling of hands and feet
- Pale or bluish lips, hands, or feet
- Weight ↑
- "My chest hurts"
- Shortness of breath, changes in or difficulty breathing



# 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



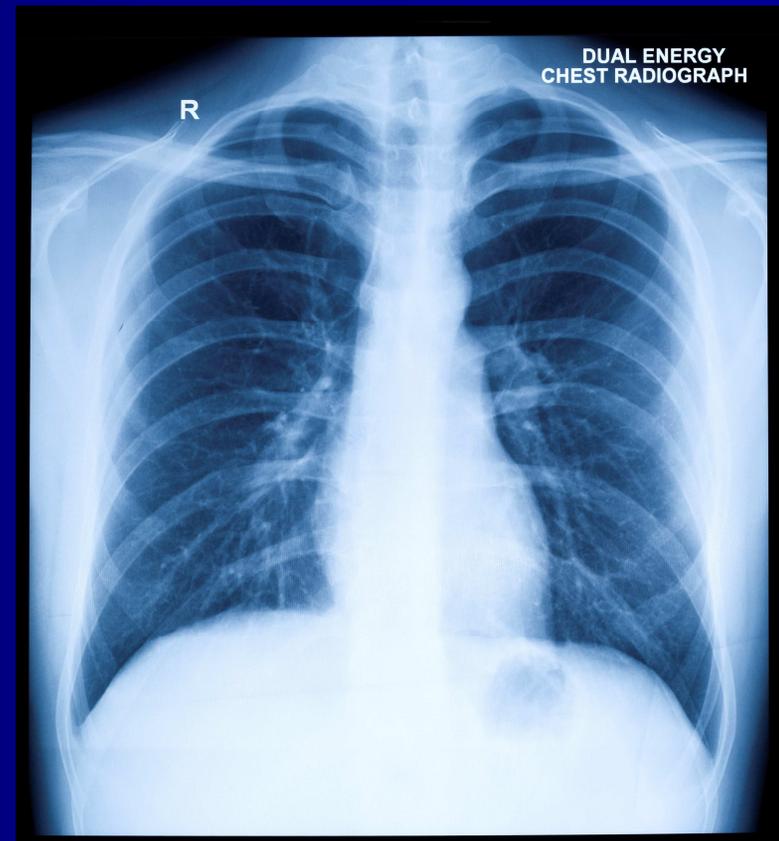
# **N.C. Nurse Aide I Curriculum**

## **MODULE H**

### **Respiratory**

# Overview

- Involves breathing in oxygen and
- Breathing out carbon dioxide



# Structure and Function

## Thorax

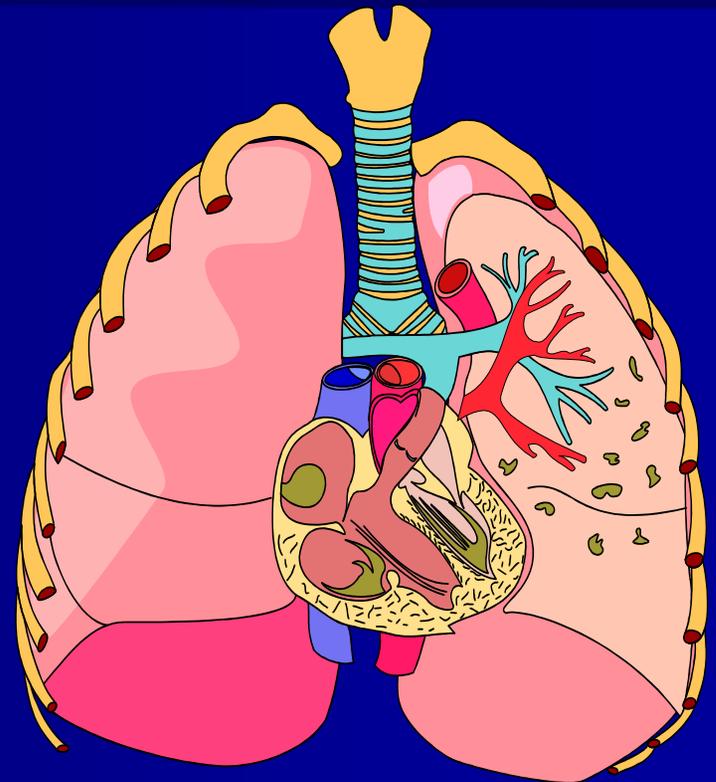
- Closed cavity that contains the structures needed for respiration
- Extends from base of neck to diaphragm

## Upper Respiratory Tract

- Nose, mouth, sinuses, pharynx, larynx & top of trachea

## Lower Respiratory Tract

- Lower trachea, bronchi & lungs



# Structure and Function

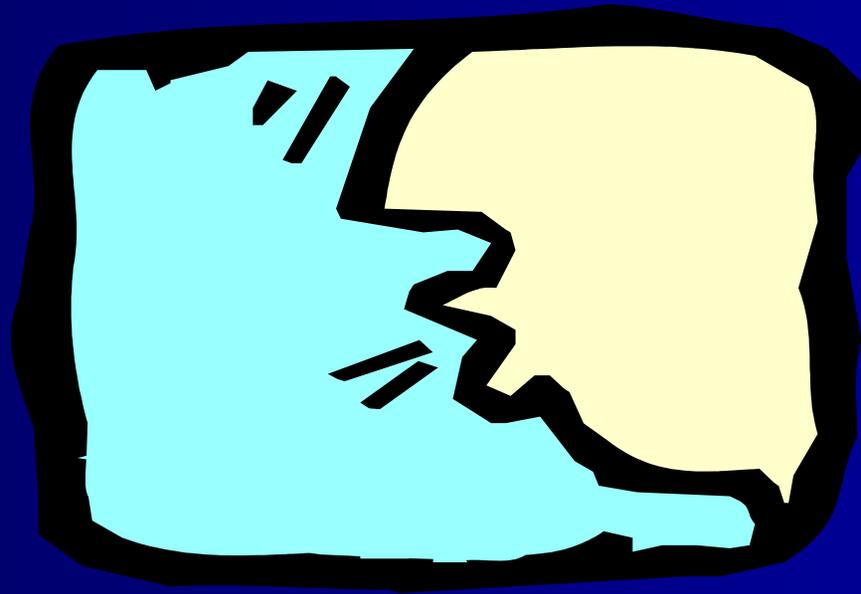
## Lungs



- 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 ↓ elasticity of lung tissue
- Shortness of breath with activity
- ↓ lung capacity
- ↓ oxygen in blood
- Weakening in diaphragm
- Limited expansion of chest



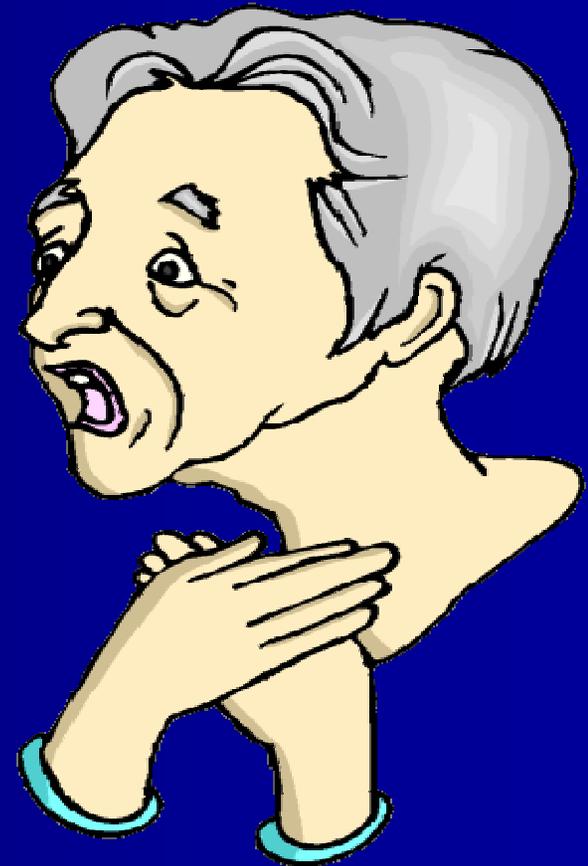
# Variation of Normal



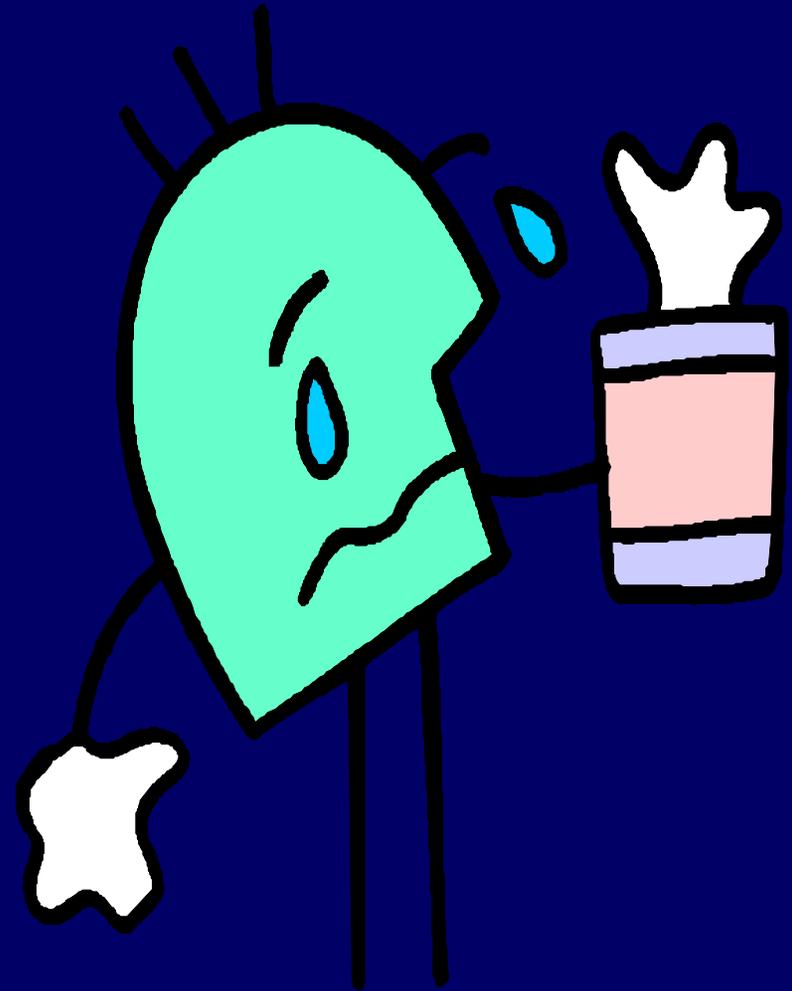
- Shallow breathing or through pursed lips
- Coughing or wheezing
- Nasal congestion or discharge, or productive cough
- Noisy respirations
- Gasping

# Variation of Normal

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



- Chronic Obstructive Pulmonary Disease (COPD)
- Pneumonia
- Emphysema
- Influenza
- Asthma



## Common Disorders

# Nurse Aide's Role



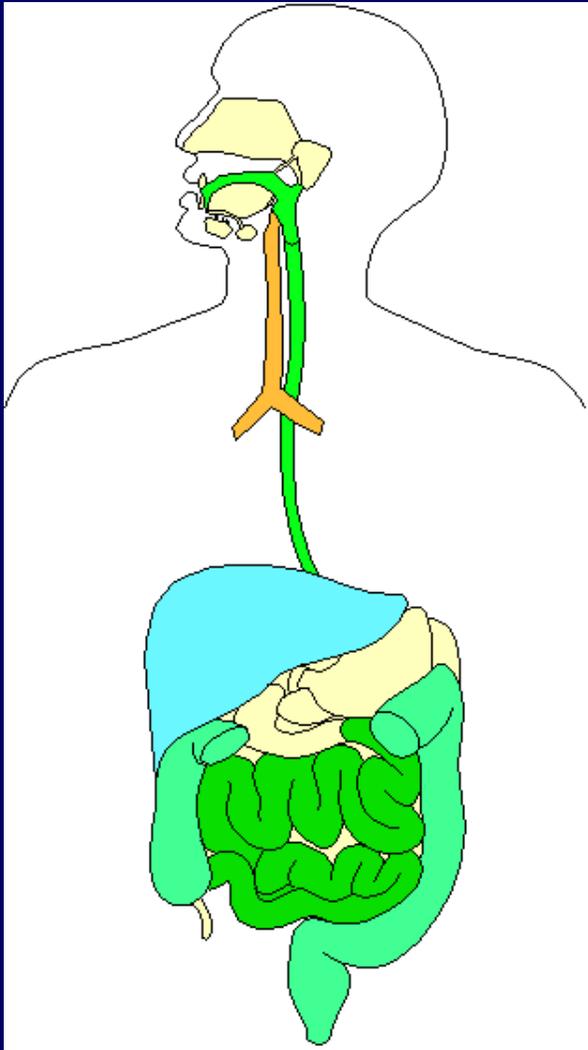
- Provide rest periods
- Encourage exercise and regular movement
- Encourage/assist with deep breathing
- Limit exposure
- Position residents

# **N.C. Nurse Aide I Curriculum**

## **MODULE H**

### **Gastrointestinal**

# Overview

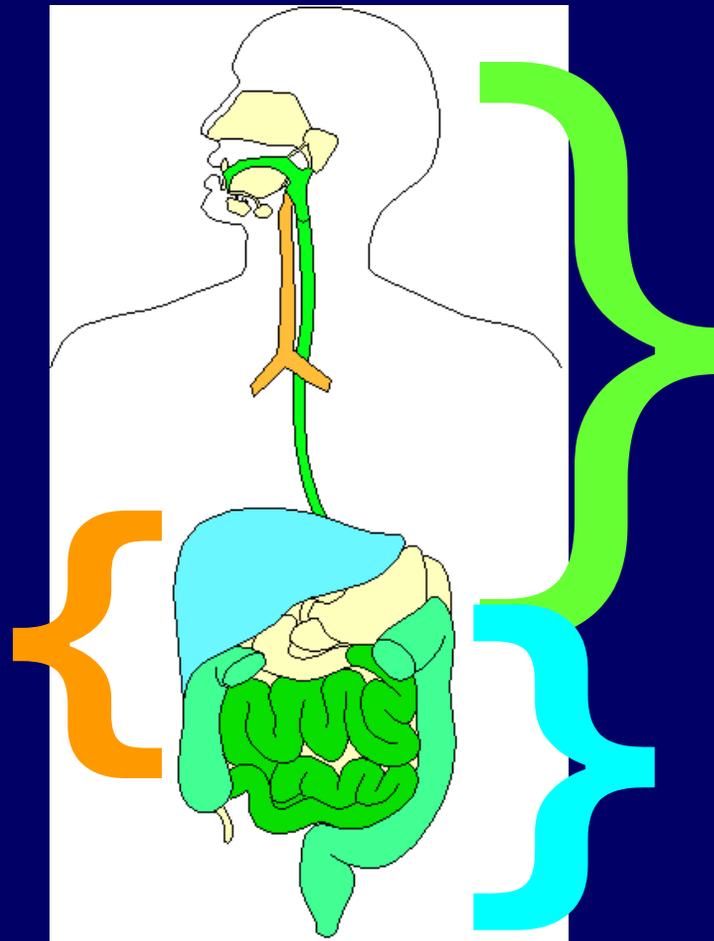


**Also known as the digestive system and extends from the mouth to the anus**

**Has 2 functions: digestion and elimination**

**Digests food,  
absorbs  
nutrients  
and  
eliminates  
waste**

**Accessory  
Structures**



**Upper GI  
Structures**

**Lower GI  
Structures**

# **Structure and Function**

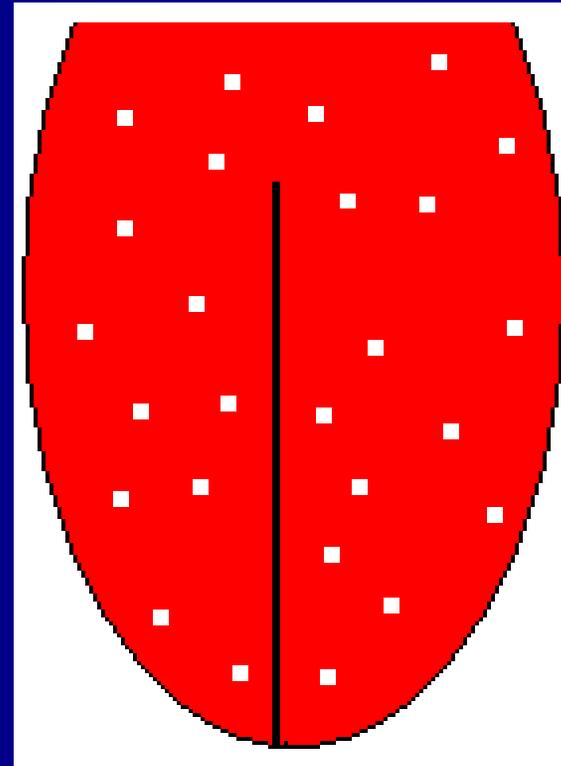
# Normal Findings

- 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

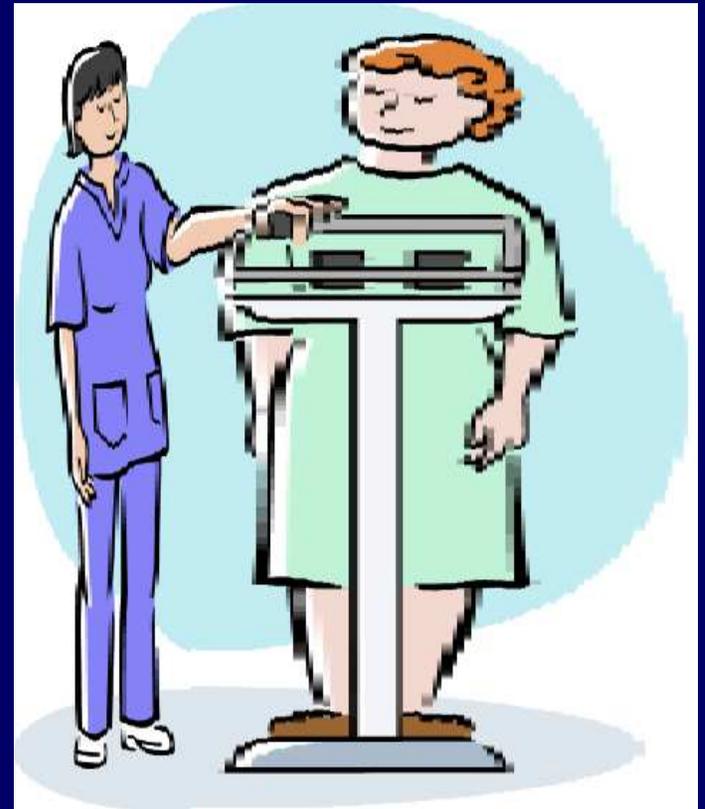
- ↓ in saliva
- ↓ in digestive enzymes and saliva
- ↓ appetite
- Loss of teeth
- Altered taste and smell



# 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



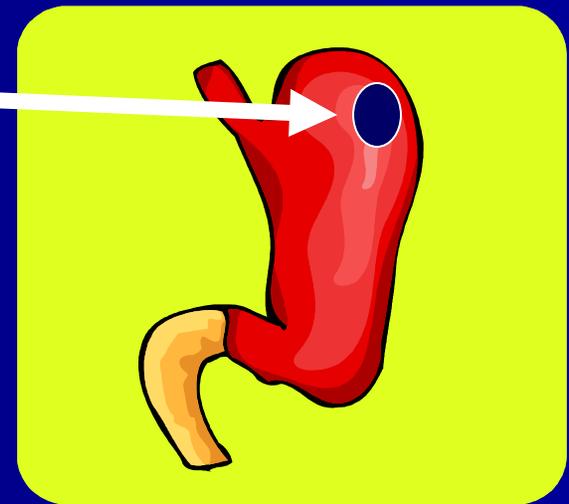
# Variation of Normal



- “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

**HEY..... PUT ME IN SO  
MY OWNER CAN EAT HIS  
DINNER!!!!!**



# **Nurse Aide's Role**

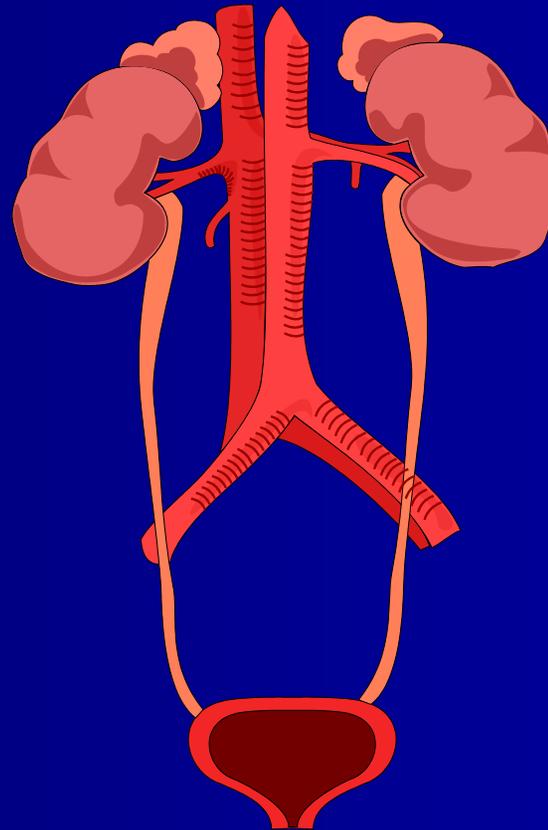
# **N.C. Nurse Aide I Curriculum**

## **MODULE H**

### **Urinary**

# Overview

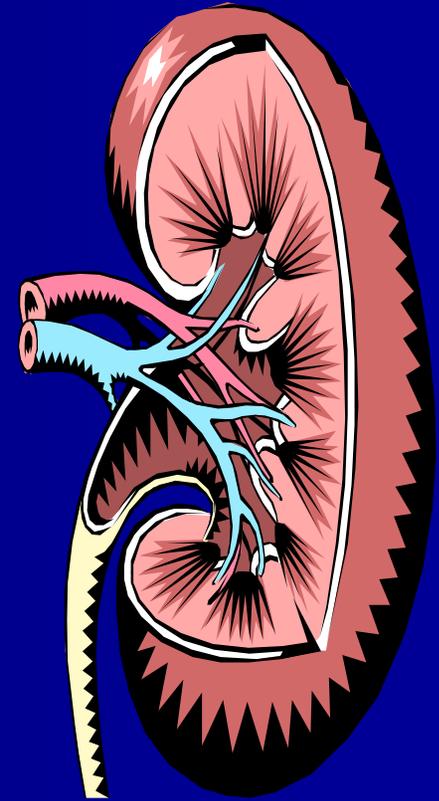
- Filtering system of the body
- Responsible for ridding body of waste products from blood



# Structure and Function

## Kidneys

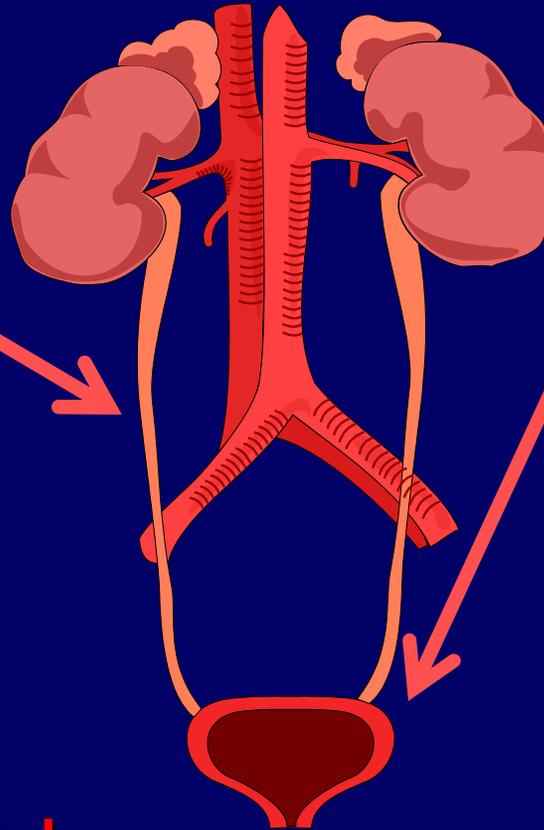
- Bean-shaped, paired organs
- Located at back or abdominal cavity, slightly above waist
- About 4 or 5 inches long and 1 inch thick
- Filter waste products and produces urine
- Help maintain water balance and blood pressure
- Regulate electrolytes



# Structure and Function

## Ureters

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



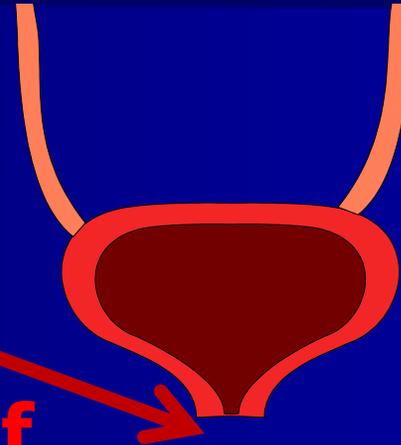
## Urinary Bladder

- Muscular sac
- Stores urine until it passes from body

# Structure and Function

## Urethra

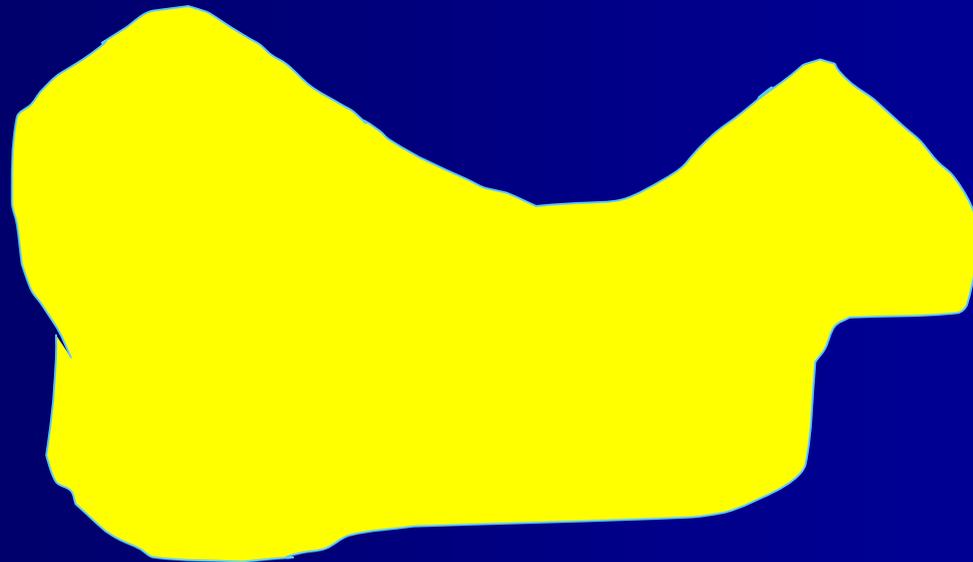
- A tube
- Located between bladder and outside of body
- About 7 or 8 inches long in males and about 1.5 inches long in females



# Structure and Function

## Urine

- Made up of water, salt & waste



# Normal Findings of Urine

- Pale yellow to amber in color
- Clear



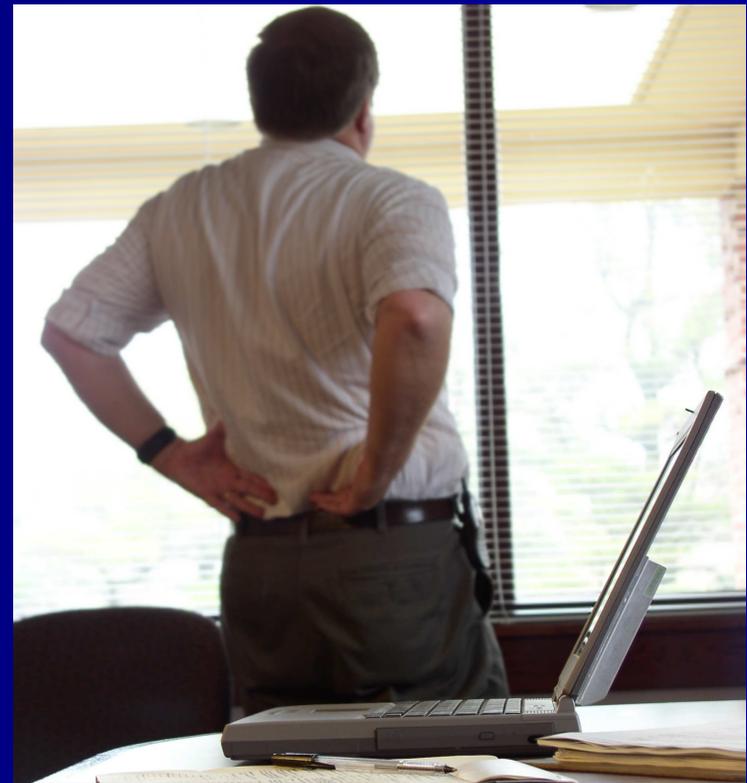
About 1000 to 1500 milliliters per day

# Changes Due to Aging

- ↓ kidney size and ability to filter
- ↓ ability to concentrate urine
- ↓ capacity, elasticity, muscle tone of bladder
- Difficulty or incomplete emptying of bladder
- ↑ prostate in males

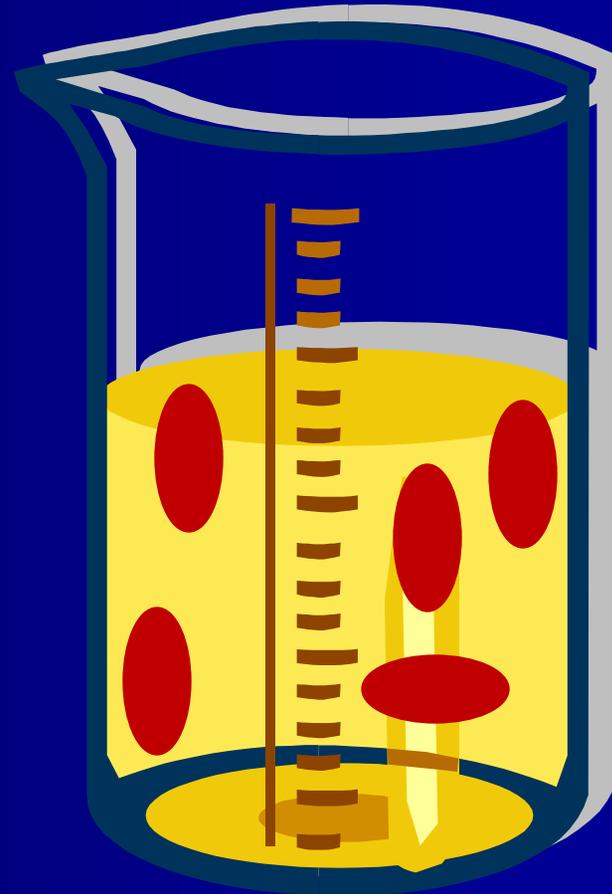
# Variation of Normal

- Changes in urine
- Weight ↑ or ↓
- 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

# **N.C. Nurse Aide I Curriculum**

## **MODULE H** **Reproductive**

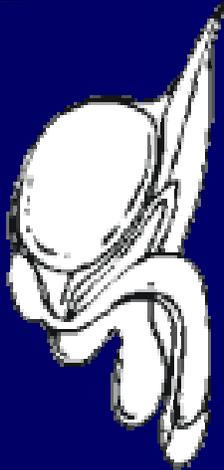
# Overview



Allows human beings to  
create a new human  
life

1. The female  
reproductive system
2. The male reproductive  
system

# Structure & Function



Male reproductive structures

Female reproductive structures



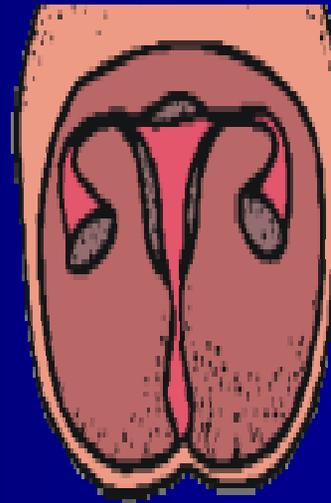
Responsible for production of reproductive cells, produce hormones responsible for sex characteristics and reproduction

# 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
- ↑ of prostate
- Sagging breasts
- Loss of hair in vulva area



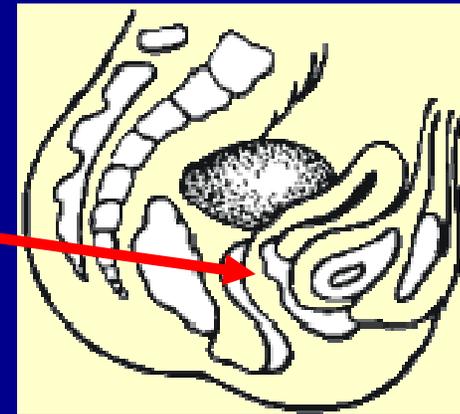
# Variation of Normal

- Bleeding
- Pain
- Discharge
- Itching

# Common Disorders

- Cystocele

- Prostatic hypertrophy



# Nurse Aide's Role



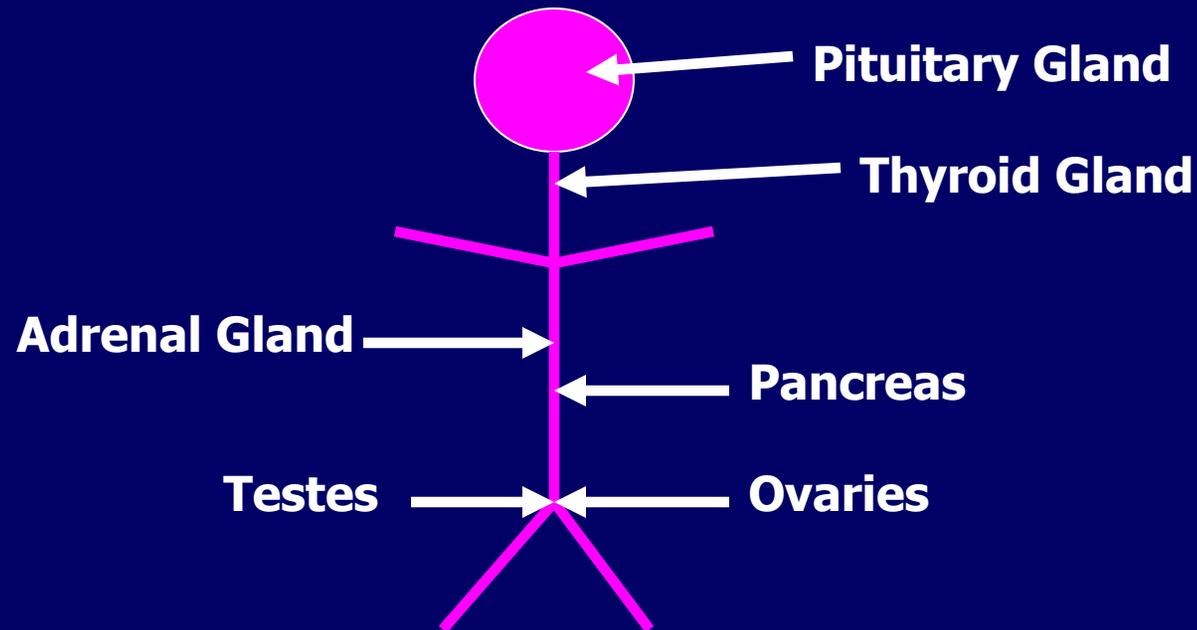
- Encourage proper nutrition and fluid intake
- Try to minimize stressors

# **N.C. Nurse Aide I Curriculum**

## **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



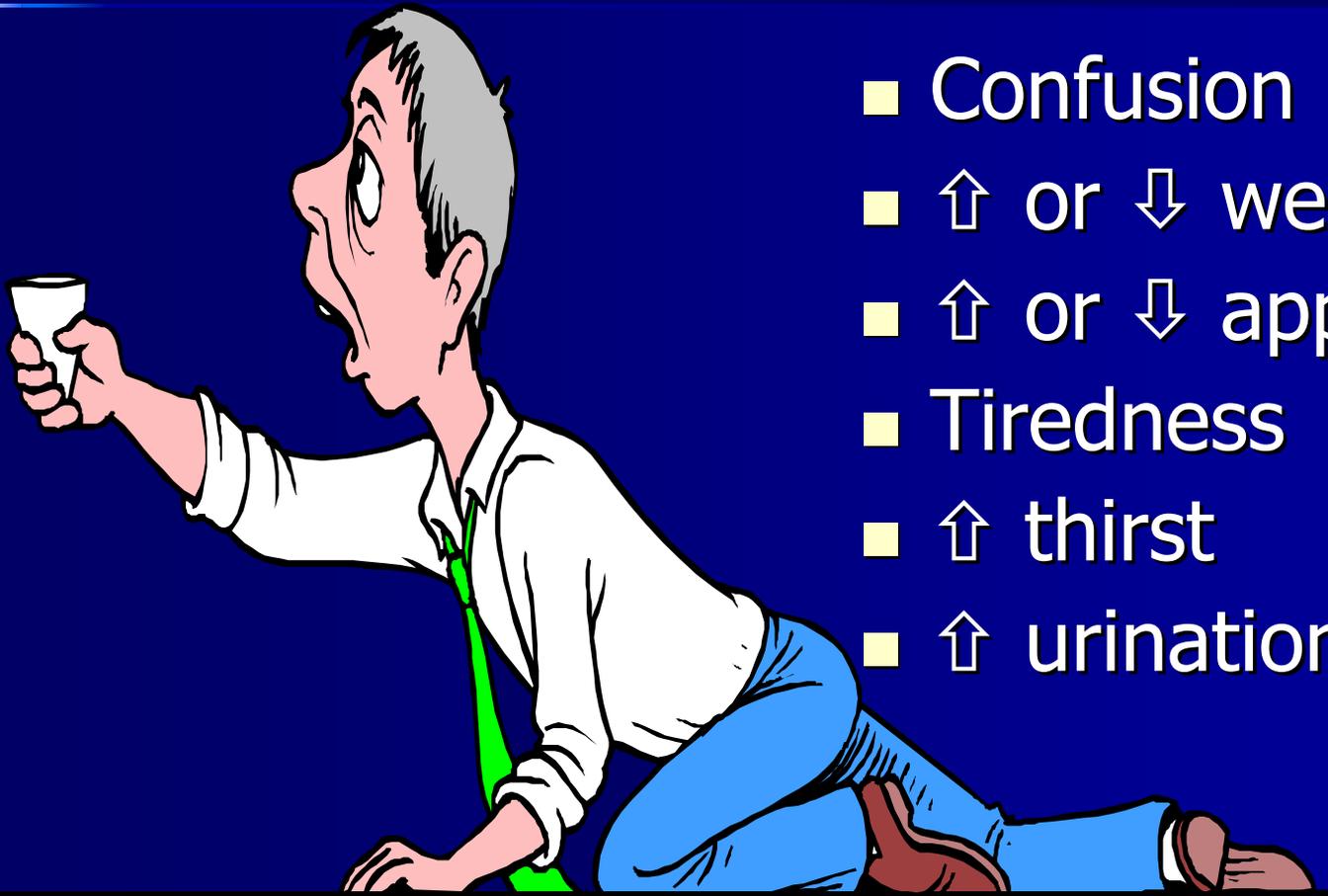
- ↓ levels of hormones
- ↓ insulin production
- Body less capable to deal with stress

# Variation of Normal

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



# Endocrine System – Variation of Normal



- Confusion
- ↑ or ↓ weight
- ↑ or ↓ appetite
- Tiredness
- ↑ thirst
- ↑ urination

# Common Disorders

- Diabetes Mellitus
- Hyper- and hypothyroidism

## Nurse Aide's Role

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



# **N.C. Nurse Aide I Curriculum**

## **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