



**SNS COLLEGE OF ALLIED HEALTH SCIENCES**

SNS Kalvi Nagar, Coimbatore - 35

Affiliated to Dr MGR Medical University, Chennai



**DEPARTMENT OF RADIOGRAPHY AND IMAGING TECHNOLOGY**

**COURSE NAME : CONTRAST AND SPECIAL RADIOGRAPHY PROCEDURES**

**II YEAR**

**UNIT : 1**

**TOPIC : GERIATRIC RADIOGRAPHY**



# GERIATRIC PATIENT



The branch of medicine that deals with all aspects of aging, including pathological and social problems. From a chronological viewpoint, medical treatment of the elderly (geriatrics) starts from the age of 65 years old.

## **PRINCIPLES OF GERIATRIC:**

The basic principle of geriatric care is mainly to help identify functional impairments in the elderly and to find ways to maximize their residual function.





# CHANGES ASSOCIATED WITH AGING



- Integumentary System
- Head and Neck
- Pulmonary System
- The Cardiovascular System
- The Gastrointestinal System
- The Hepatic System
- The Genitourinary System
- Musculoskeletal System
- The Neurologic System





# INTEGUMENTARY SYSTEM



- The skin wrinkles, becomes lax.
- The vascularity of the dermis decreases, and the skin of white people begins to look paler and more opaque.
- Skin on the back of the hands and forearms becomes thin and fragile.
- Nails lose their luster and may yellow and thicken, especially the toenails.
- Hair loses its pigment and begins to gray.
- Hair patterns change and the hair becomes thin and more brittle.
- There is hair loss on the scalp and other body areas.





# IMPLICATIONS FOR THE RADIOGRAPHERS



The skin of the geriatric patient is more fragile than that of a younger person and is thus more easily traumatized. Ensure that the skin of the elderly patients is not damaged.







# CHANGES IN THE HEAD AND NECK



- There is mild loss of visual acuity, particularly **presbyopia**.
- The light-sensing threshold is affected and adaptation from light to dark and color preception diminish.
- Tear production is either reduced or increased.
- The skin of the eyelid loosens and the muscle tone decreases.
- Sensory, neural and conductive changes occur in the ear.
- Hearing loss is common.
- There is a loss of muscle mass in the neck.
- There is an accentuated forward upper thoracic curve, which may result in **kyphosis**.





# IMPLICATIONS FOR THE RADIOGRAPHER



- Rapid changes in lighting, such as moving from a brightly lighted waiting room into a darkened examining room, may cause the elderly patient momentary blindness. Offer patients assistance so that they do not fall.
- Loss of sense of smell and hearing loss must be considered. The radiographer must ascertain that the patient is able to hear directions and must speak loudly enough for the patients to understand what is being said. Do not assume that all elderly patients have a hearing deficit and need to be spoken to in an abnormally loud voice.
- During fluoroscopic examinations, background noise from the equipment may prevent the patient from hearing the instructions. Be especially careful to clearly state instructions and check for understanding.





# PULMONARY SYSTEM



- Pulmonary function changes with age; lung capacity diminishes owing to stiffening of the chest wall, among other changes.
- The cough reflex becomes less effective.
- The normal respiratory defense mechanisms lose effectiveness.







# IMPLICATIONS FOR THE RADIOGRAPHER



- The patient becomes breathless and fatigues more easily. Because of the decreasing effectiveness of the cough reflex, the patient is more apt to aspirate fluids when drinking. There will be an increased risk of pulmonary infections resulting from the loss of respiratory defense mechanism. A patient with chronic pulmonary disease cannot be expected to lie flat for more than brief periods of time, since this position increases dyspnea.
- During chest radiographic examination, when possible ask the geriatric patient to hold his or her breath on the second full inhalation to ensure full lung expansion.
- The radiographer must instruct the patient to drink slowly to avoid choking when drinking the contrast media for an upper GI examination. Position the patient in an upright sitting position to prevent aspiration.

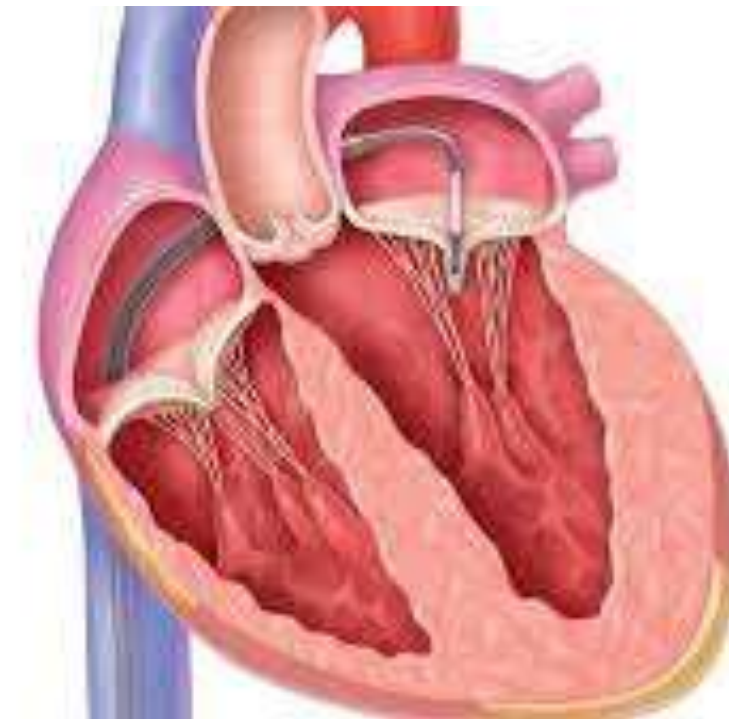




# THE CARDIOVASCULAR SYSTEM



- Structural changes occur in the heart as aging progresses.
- The coronary arteries calcify and lose elasticity.
- The aorta and its branches dilate and elongate ; the heart valve thickens.
- There is a decline in coronary blood flow.





# IMPLICATIONS FOR THE RADIOGRAPHER



- Owing to normal cardiovascular changes of aging, the elderly patients tire more easily; imaging examinations and procedures should be conducted in as efficient a manner as possible to avoid fatigue. If a procedure is unavoidably lengthy, the patient must be allowed to rest at intervals.
- Hypothermia and complaints of feeling cold are common problems for the elderly patient because of decreased circulation; therefore it is important to avoid chilling. Additional blankets may be helpful to prevent discomfort or in extreme cases, hypothermia during and between radiographic examinations.







# THE GASTROINTESTINAL SYSTEM



- Gastric secretion, absorption and motility decrease.
- There is a predisposition to dryness of the mouth and swallowing reflex becomes less effective.
- The abdominal muscles weaken.
- Absorption of iron, vitamin B12 and folate decreases with resulting potential for anemia.
- Esophageal motility declines.
- The tone of the internal anal sphincter decreases.

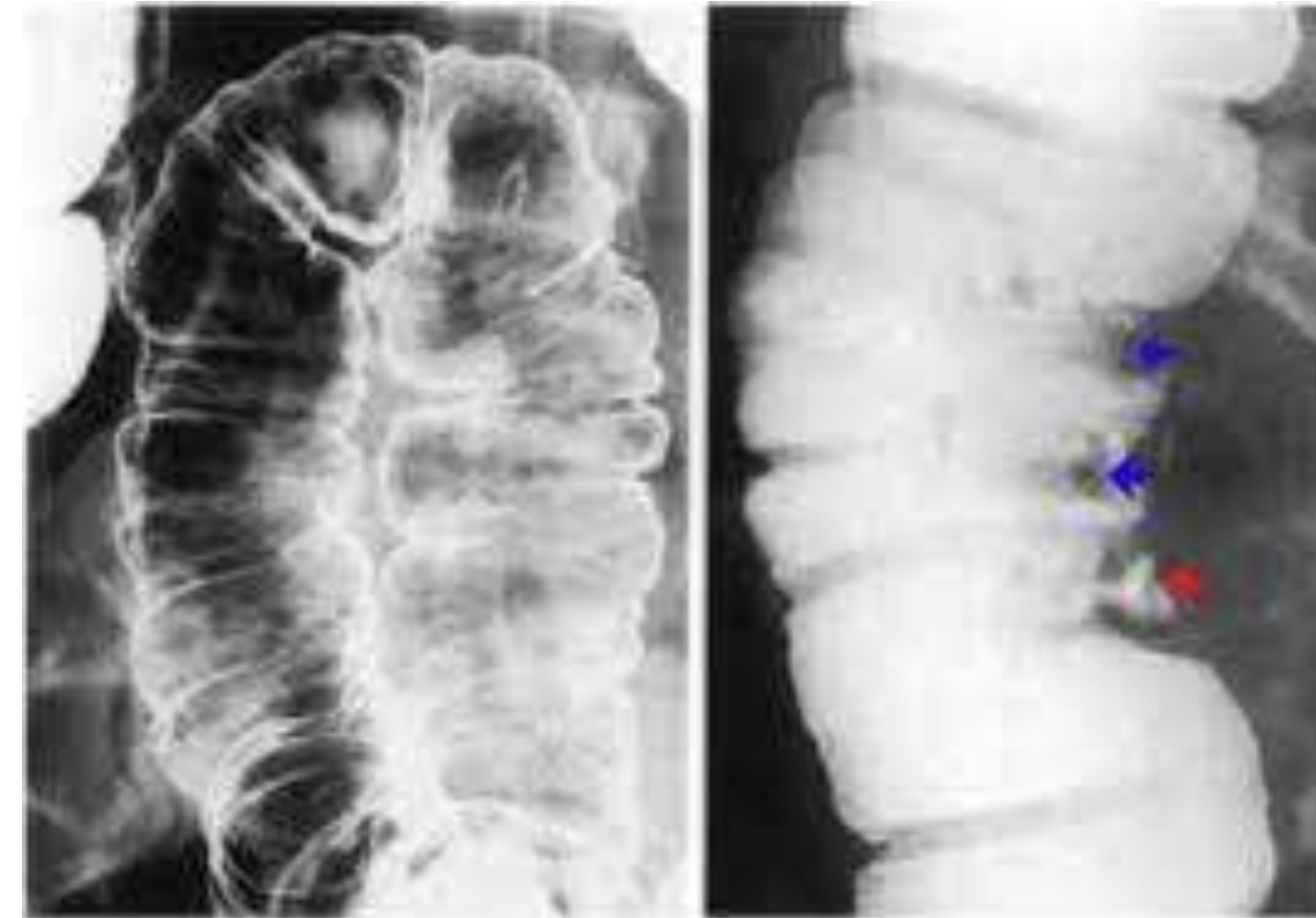




# IMPLICATIONS FOR THE RADIOGRAPHER



- If the patient is required to fast before a diagnostic examination, schedule the examination for the early morning so that the patient can have breakfast close to the usual time.
- Medications may not be dissolved and absorbed from the stomach as effectively or as they are meant to be. Therefore, the ability to swallow is also affected. This may impair the elderly patient's ability to drink liquid contrast agents. Instruct the patient to drink slowly to avoid choking. The patient who must drink liquid in the imaging department must be positioned in an upright sitting position to prevent aspiration.



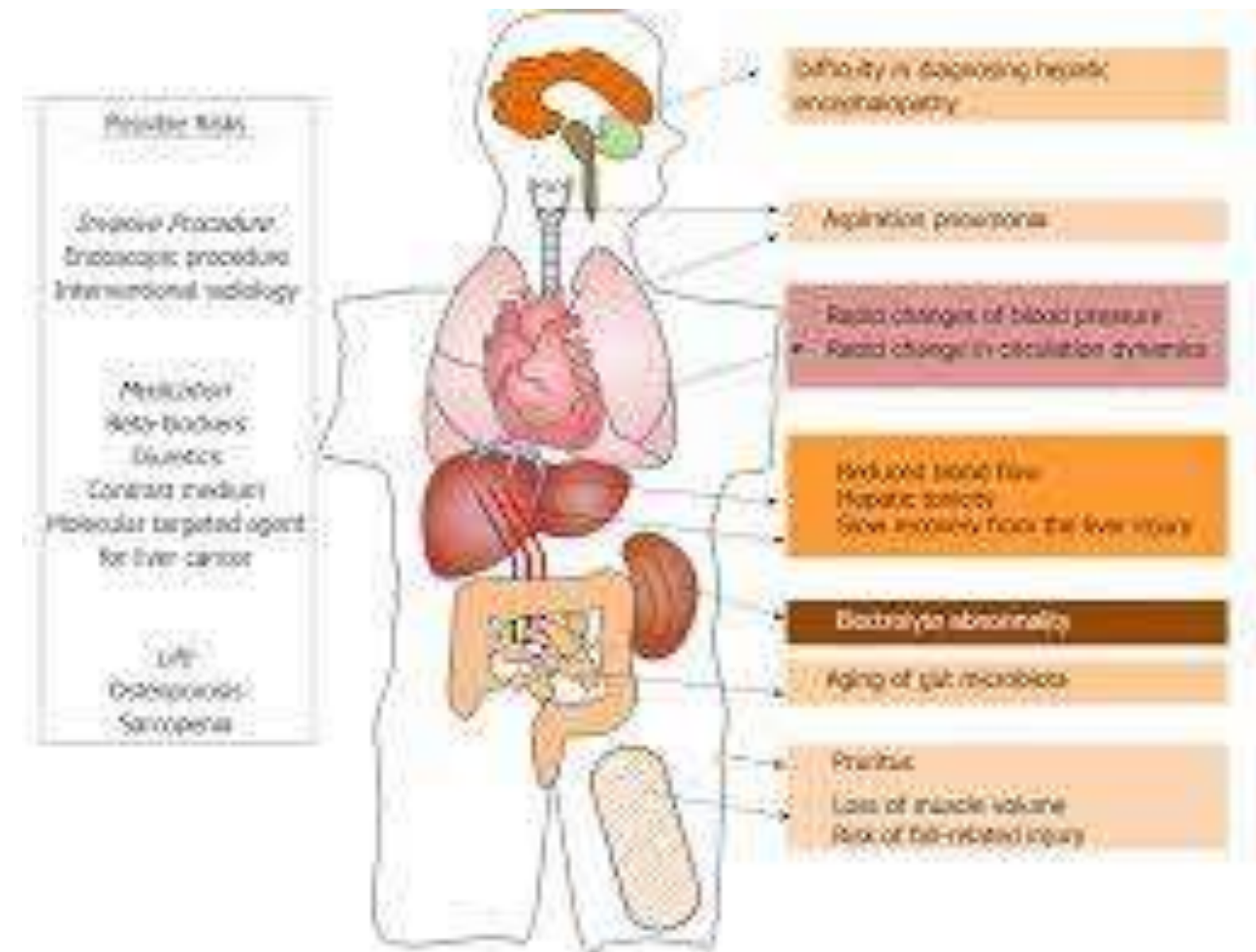




# THE HEPATIC SYSTEM



- Liver size decreases.
- Enzyme activity and the synthesis of cholesterol decrease.
- Bile storage is reduced.







# IMPLICATIONS FOR THE RADIOGRAPHER



- The elderly person has an increased potential for drug toxicity, since most drugs are metabolized in the liver. Be alert for adverse drug reactions in the elderly patients.





# THE GENITOURINARY SYSTEM



- **Normal changes of aging : Women**
- Muscle tone and bladder capacity decreases.
- Vaginal atrophy occurs.
- Involuntary bladder contractions increase.





# THE GENITOURINARY SYSTEM

- **Normal changes of aging : Men**
- The prostate gland enlarges.
- The capacity of the urinary bladder is reduced by 500 to 900 ml. The excretory urographic and the cystogram exams demonstrate the urinary bladder.
- The size of the penis and testes is decreased, owing to sclerosis of blood vessels.







# IMPLICATIONS FOR THE RADIOGRAPHER



- Loss of muscle tone in the female genitourinary system may make the patient more susceptible to urinary incontinence in stressful situations. Both the elderly male and female patient may have a limited bladder capacity and may need to urinate more frequently. Have a bedpan and urinal available for elderly patients who cannot use the lavatory easily.



# MUSCULOSKELETAL SYSTEM



- Bone mass is reduced and bones become weaker.
- Muscle mass decreases. Muscle cell decrease in number and are replaced by fibrous connective tissue.
- Muscle strength decreases.
- Intervertebral disc shrinks and vertebrae collapse.
- Articular cartilage erodes.
- The normal lordotic curve of the lower back flattens.
- Flexion and extension of the lower back are diminished.
- Placement of the neck and shaft of the femur changes.







# IMPLICATIONS FOR THE RADIOGRAPHER



- Increased muscular weakness increases a patient's discomfort when he or she is expected to assume positions necessary for imaging procedures. Painful joints and deformities accompanied by decreased tolerance for movement also increase discomfort. The radiographer must assist the patient to the required position and then support him or her with positioning sponges to facilitate maintaining that position. The risk of falling is greater when caring for elderly patients owing to musculoskeletal changes. It is the radiographer's obligation to assist patients in positioning and in getting on and off the radiographic table to prevent falls.







# RADIOGRAPHERS RESPONSE FOR PATIENTS WHO HAD ARTHROPLASTIC SURGERY



- When the patient with a recent arthroplasty comes to the radiographic imaging department, the radiographer must understand and adhere to the limits that have been placed on the patient's weight bearing and mobility of the restricted joint.
- Move patients who have had hip, knee or ankle arthroplasty to and from the department by gurney. They cannot get onto and off the radiographic table without placing weight on the affected limb. Move patient toward their affected side in this situation.
- After hip arthroplasty, do not allow the patient's affected leg to adduct (move toward the center of the body). Keep a pillow or block between the legs to prevent this.





# THE NEUROLOGIC SYSTEM



- The ability to store information changes very little in the absence of disease; however, some short-term memory loss occurs.
- Sensorimotor function diseases.
- Reaction time to both simple and complex stimuli decreases.
- The time needed to perform activities increases.
- The lens of the eye thickens, making the pupils of the eye appear smaller.
- There is a decrease in postural stability that is greater in women than in men.
- Problems with spatial relations.
- There is loss of sensitivity to deep pain.







# IMPLICATIONS FOR THE RADIOGRAPHER



- Remember that the elderly patient is less responsive to painful stimuli and is not aware of a painful stimulus until an injury has occurred. The radiographer must increase awareness of potential for patient injury.
- The elderly patient may have visual problems in the dimly lit radiographic imaging room. For example : the patient may not see the stool to determine where to place the feet to step down from the radiographic table.
- The elderly patients processes information and direction in a slower fashion. The radiographer must be certain that the patient understands directions and allow him or her more time to execute moves.



## DONT'S



- Physical abuse or violence : the use of physical force that may result in bodily injury,physical pain or impairment.
- Sexual abuse : nonconsensual sexual contact of any kind with an elderly person.
- Emotional or psychological abuse : the inflicting of anguish,pain or distress through verbal or nonverbal acts.
- Isolation or caregiver's neglect or self-neglect : the refusal or failure to fulfill any part of a persons obligations or duties to an elder or self.
- Financial abuse : occurs when anyone takes or keeps an elder's property with the intent to defraud.





## DONT'S



- Avoid pinching patient's skin, rough handling or shoving while transferring the geriatric patient from a gruney or wheel chair onto the radiographic table.
- When immobilizing elderly patients, utilize the standards of care for immobilizing the geriatric patient as prescribed by the institution during radiographic procedures.
- Assist geriatric patients when they ask for help.





## CONCLUSION



Each senior patient must be assessed to discover if they have any particular needs. The imaging technician must be able to tell the difference between physical limitations caused by normal ageing and those caused by disease or abuse. Joint replacement surgery patients are given precise postoperative instructions. The radiographer is required to inquire about the patient's mobility and weight-bearing constraints. Patients who have had hip arthroplasty should not abduct the affected leg or flex the hip more than 90 degrees when sitting. Knee arthroplasty patients must not flex their affected joint more than 90 degrees. The value of honoring the patient's beliefs and values will improve, resulting in a favorable imaging procedure outcome







**THANK YOU**