

□ Principles of CT and MRI

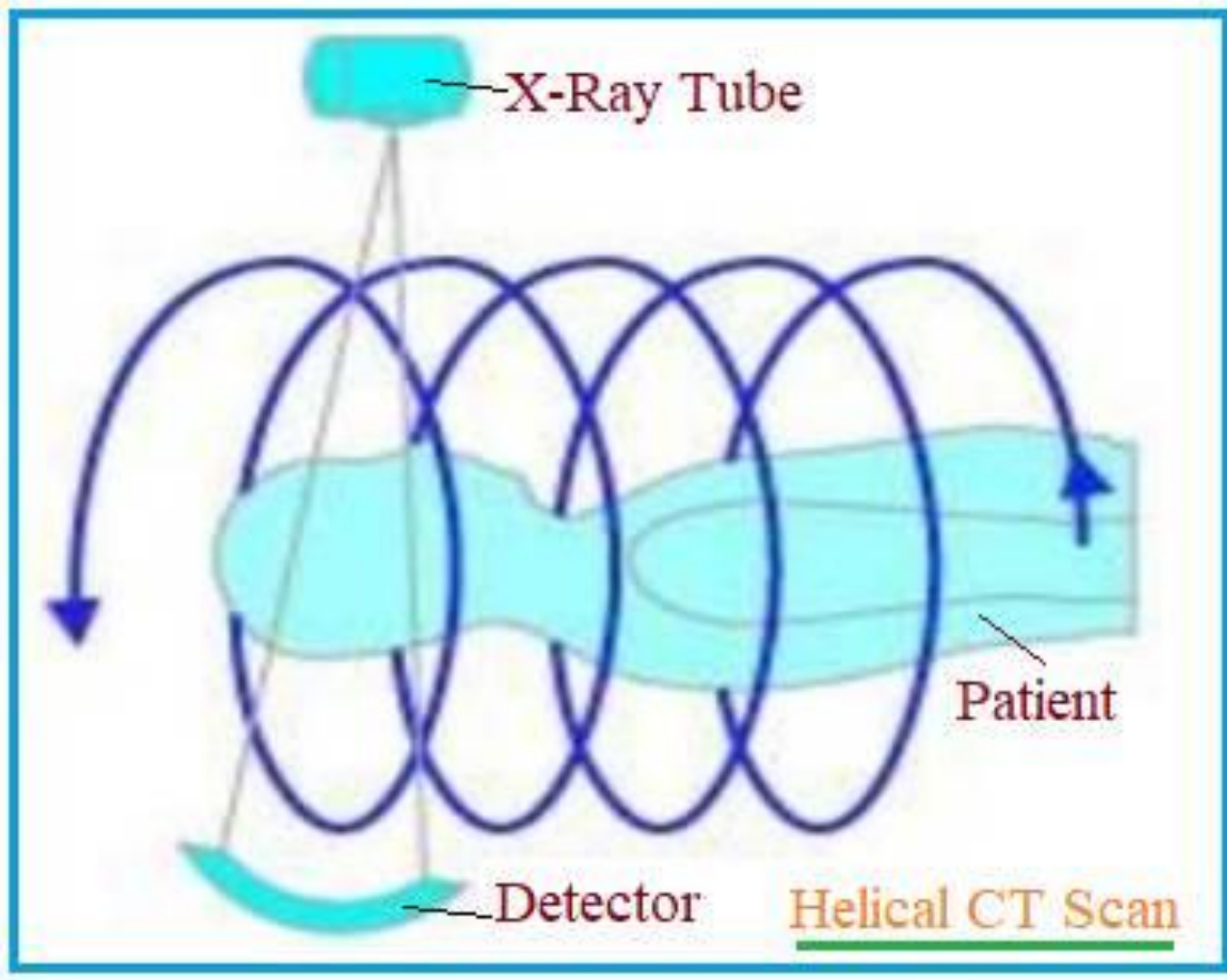
□ Lecturer :

□ DR: Huda Hameed

What is CT scan

CT scanner consists of x-ray tube which emits finely collimated fan shaped x-ray beam directed through patient to the series of scintillation detectors.

A CT scan may use contrast, which is a type of fluid that can be swallowed, injected into a vein, or inserted into the rectum during the exam to make it easier to see certain parts of the body.



□ **Benefits or advantages of Computed Tomography**

- The CT technique eliminates superimposition of images of undesired structures completely.
- It offers higher contrast resolution.
- ➡ It provides more detail compare to ultra sonography.
- ➡ It is quicker, cheaper and superior to MRI scanning.
- ➡ Motion artifacts are of less concern in CT scan than MRI
- Pick up acute bleed.
- Good visualization of body structures and calcified lesions.

❑ **Drawbacks or disadvantages of Computed Tomography**

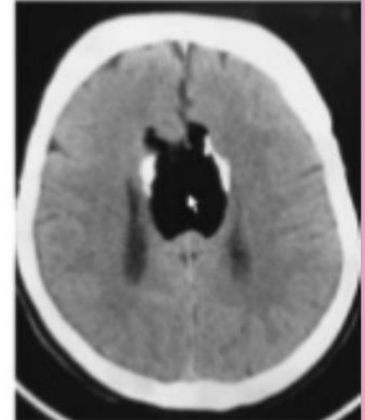
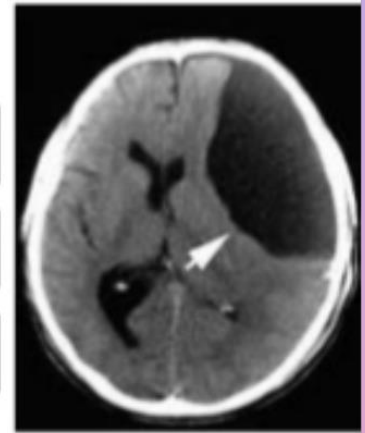
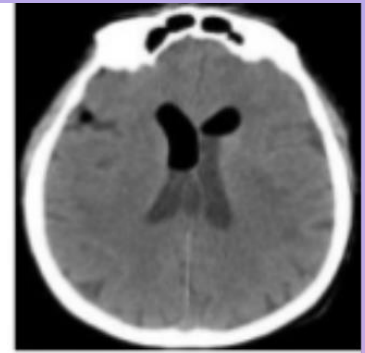
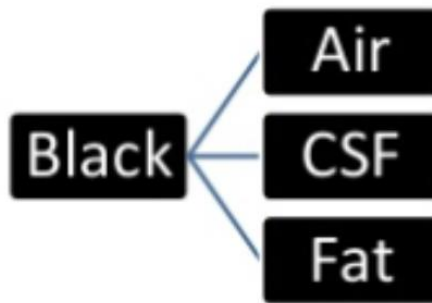
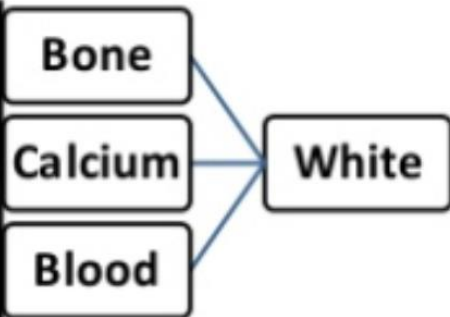
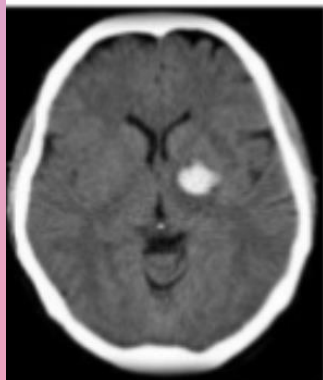
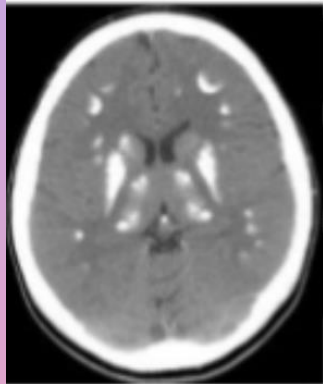
- ❑ ➡ It is time consuming.
- ➡ It is expensive for routine clinical use.
- ➡ The patient is exposed to higher radiation.
- ➡ It requires expensive equipment and hence it is not always accessible at all levels of people.
- ➡ There is risk of ionizing radiation and iodinated contrast agents
- ❑ Risk of kidney problem if inject contrast and allergic reaction.
- ❑ risk of childhood cancer and leukemia in mothers who have imaging during pregnancy

MRI

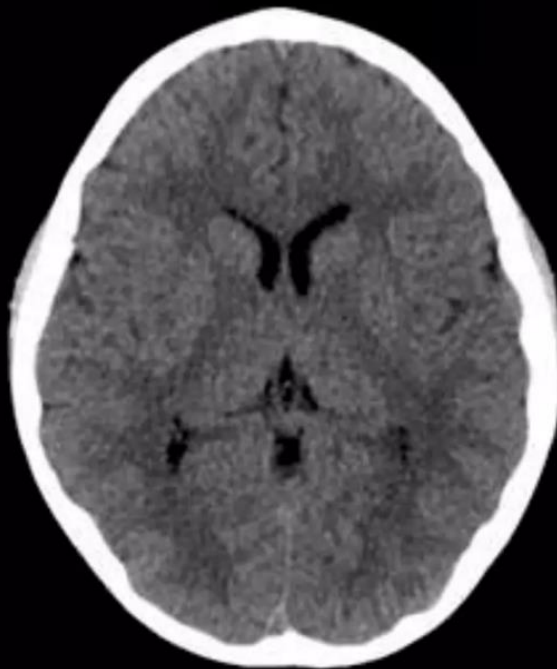
- Is a test that used a magnetic field and pulses of radio wave energy to make pictures of organs and structures inside the body.
- **Advantages of MRI :**
 - 1. no radiation exposure.
 - 2. good resolution.
 - 3. 3D reconstruction.
 - 4. good gray –white matter differentiation.
 - 5. Gadolinium contrast is relatively non toxic.

☐ **MRI disadvantages:**

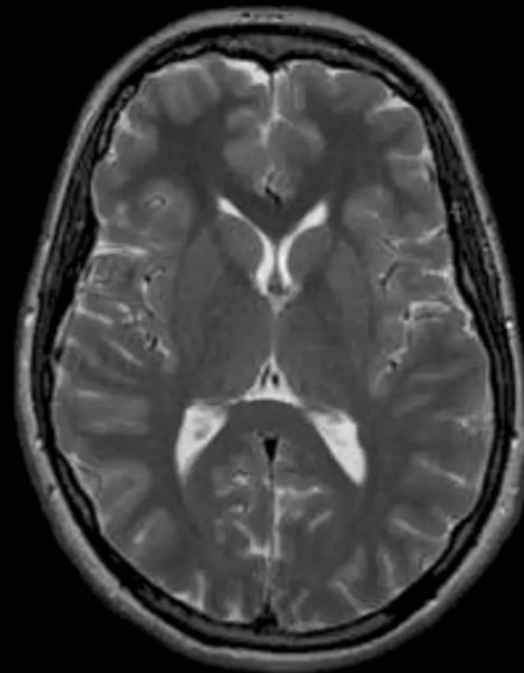
- ☐ 1.costy.
- ☐ 2.contraindicated in some pace maker and cochlear implants.
- ☐ 3.claustrophobia.
- ☐ 4.time consuming and noise producing.
- ☐ 5.limited availability.



CT



MRI



CT



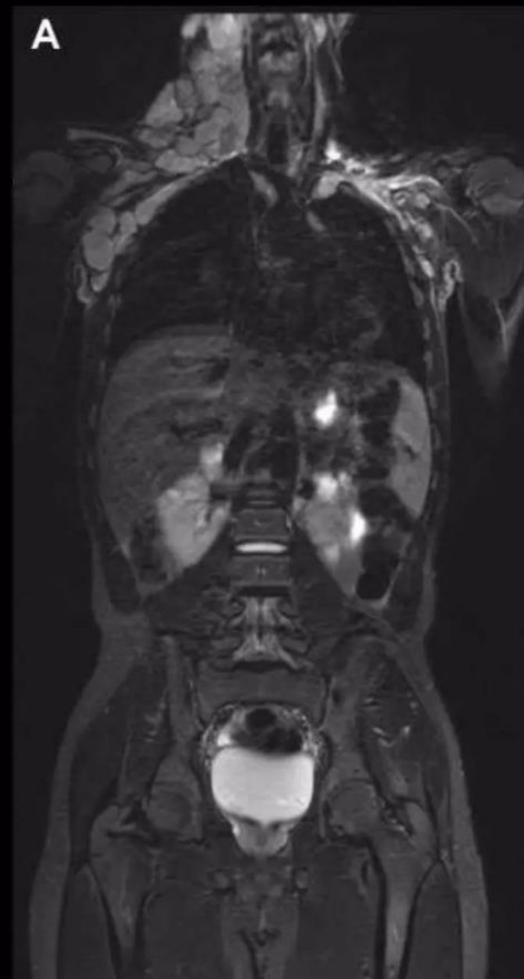
MRI



CT

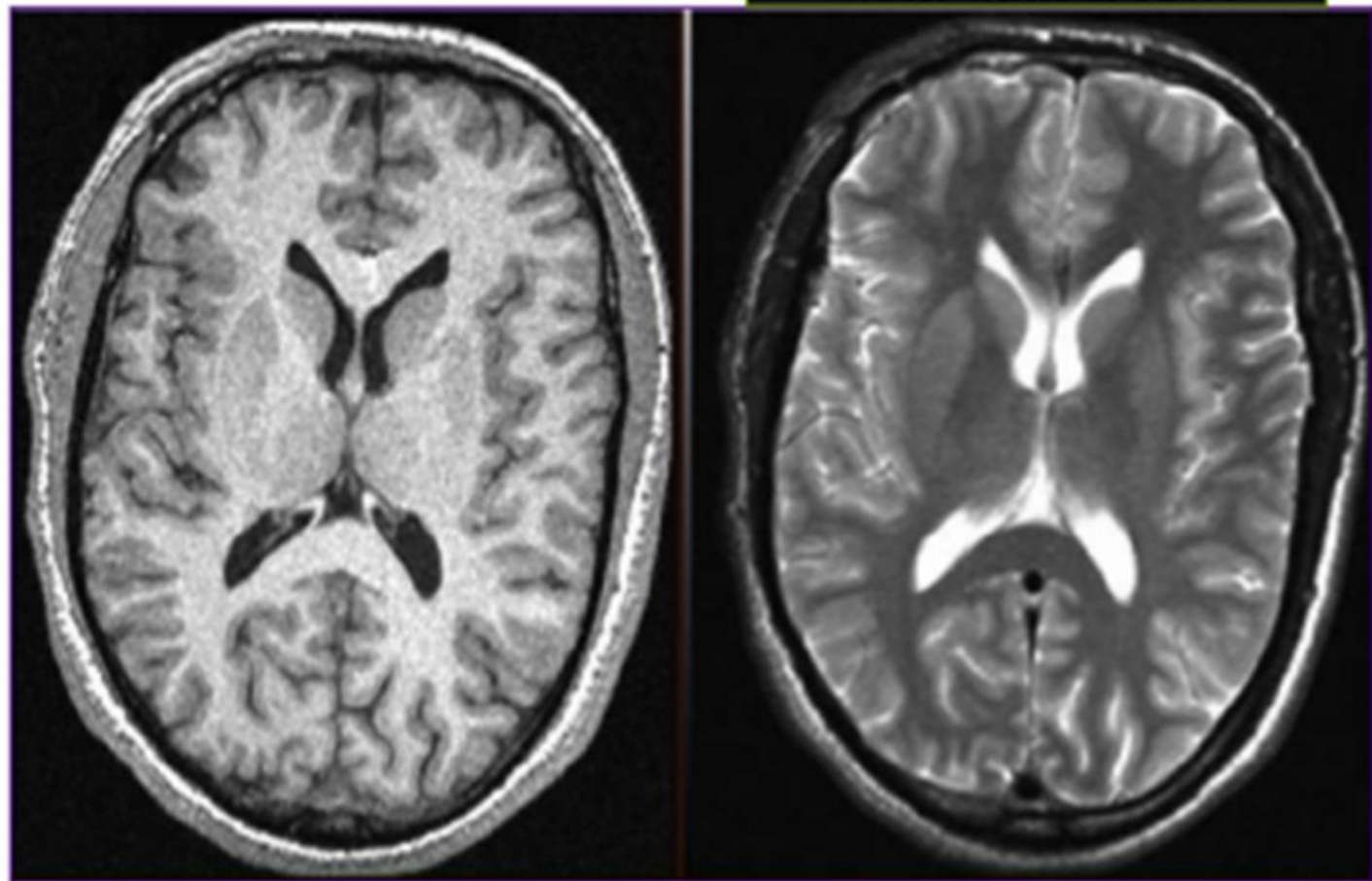


MRI



T1W AND T2 W IMAGES

World war 2
Water white at T2WI





Thank
You