The background of the slide features a collage of medical imaging scans, including axial and sagittal views of a human brain. A prominent white diagonal banner runs from the top-left towards the bottom-right, creating a split-screen effect. The text is centered on the white portion of the banner.

RADIOLOGY

**MODALITIES OF
IMAGING**

1. X-RAY FILM

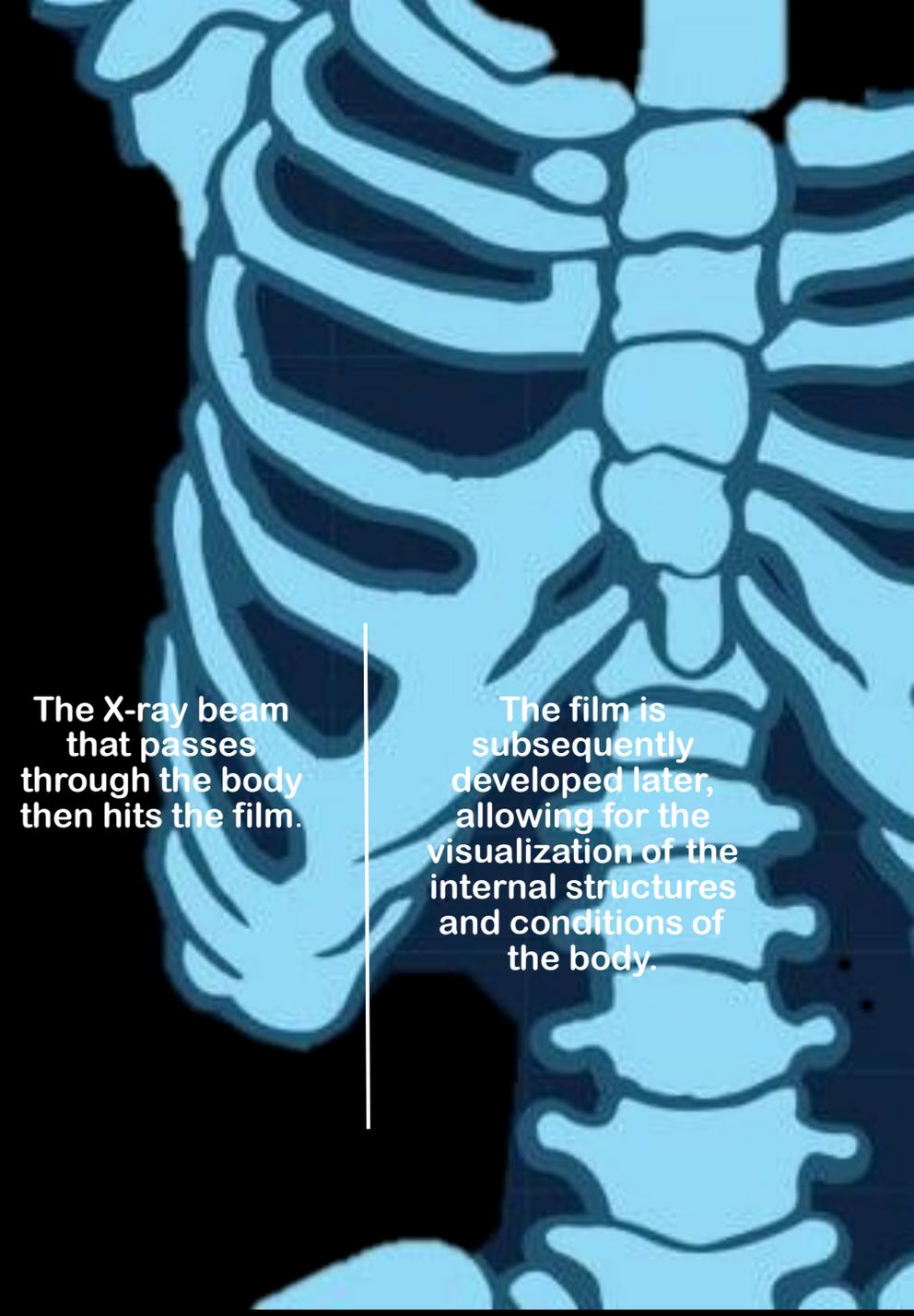
X-rays are a form of ionizing radiation that consists of directional and energetic electrophotons emitted from an X-ray tube,

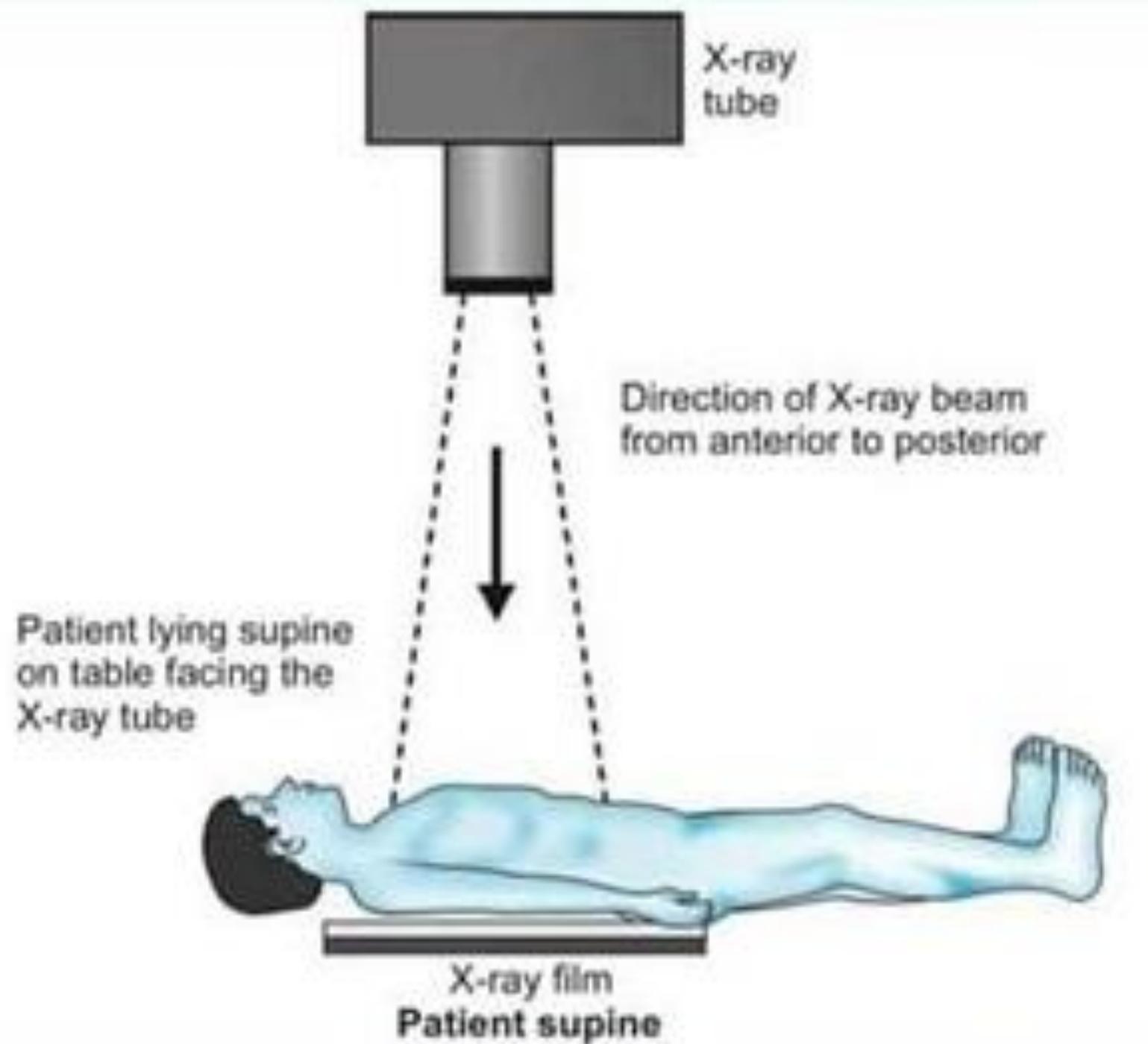
They are used to target specific areas of the body such as the chest, leg, hand, and more.

As the X-rays hit the body, there is a change in the direction and/or energy of the photons.

The X-ray beam that passes through the body then hits the film.

The film is subsequently developed later, allowing for the visualization of the internal structures and conditions of the body.





ABOUT X-RAYS



ADVANTAGES

DISADVANTAGES



ADVANTAGES OF X-RAYS



Easily performed.

Available in almost all radiology centers .

Not expensive.

The first modality of imaging in many radio pathologies .

Shows bone, metallic object with no artifacts.

DISADVANTAGES OF X-RAYS



**Almost Not
allowed for
pregnant women.**

**Radiation
exposure (but
smaller dose than
CT scan).**

**Limited diagnostic
information in any
radiological cases.**

EXAMPLES OF X-RAYS

**CHEST
X-RAY**

**ABDOMEN
X-RAY**

KUB

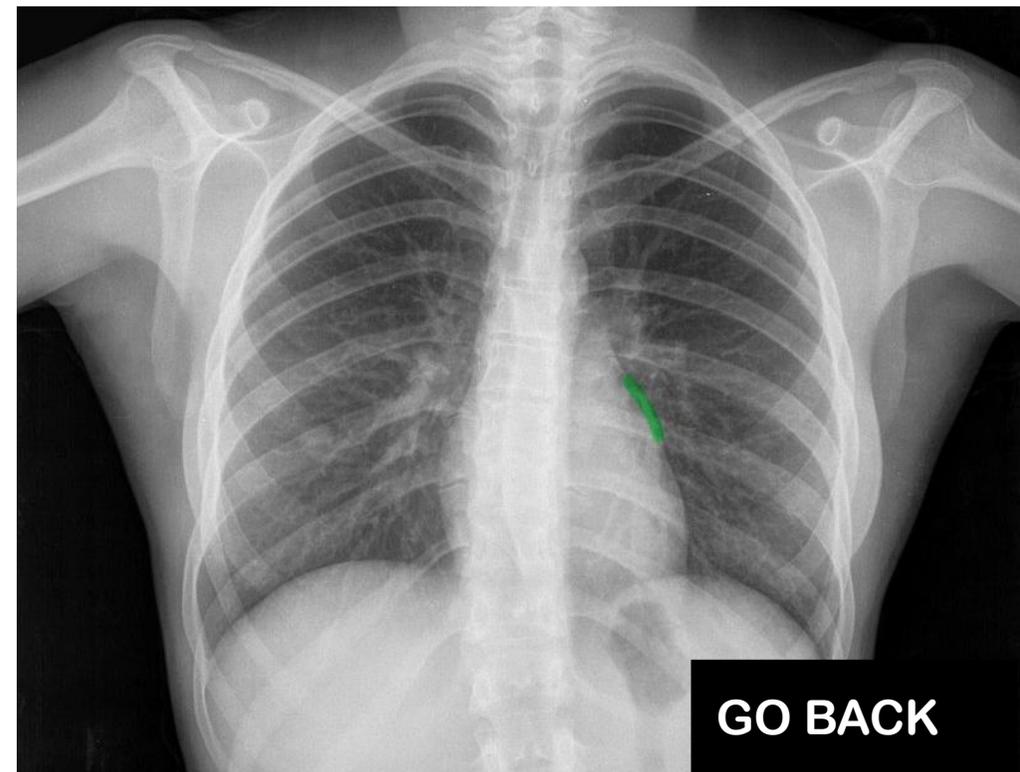
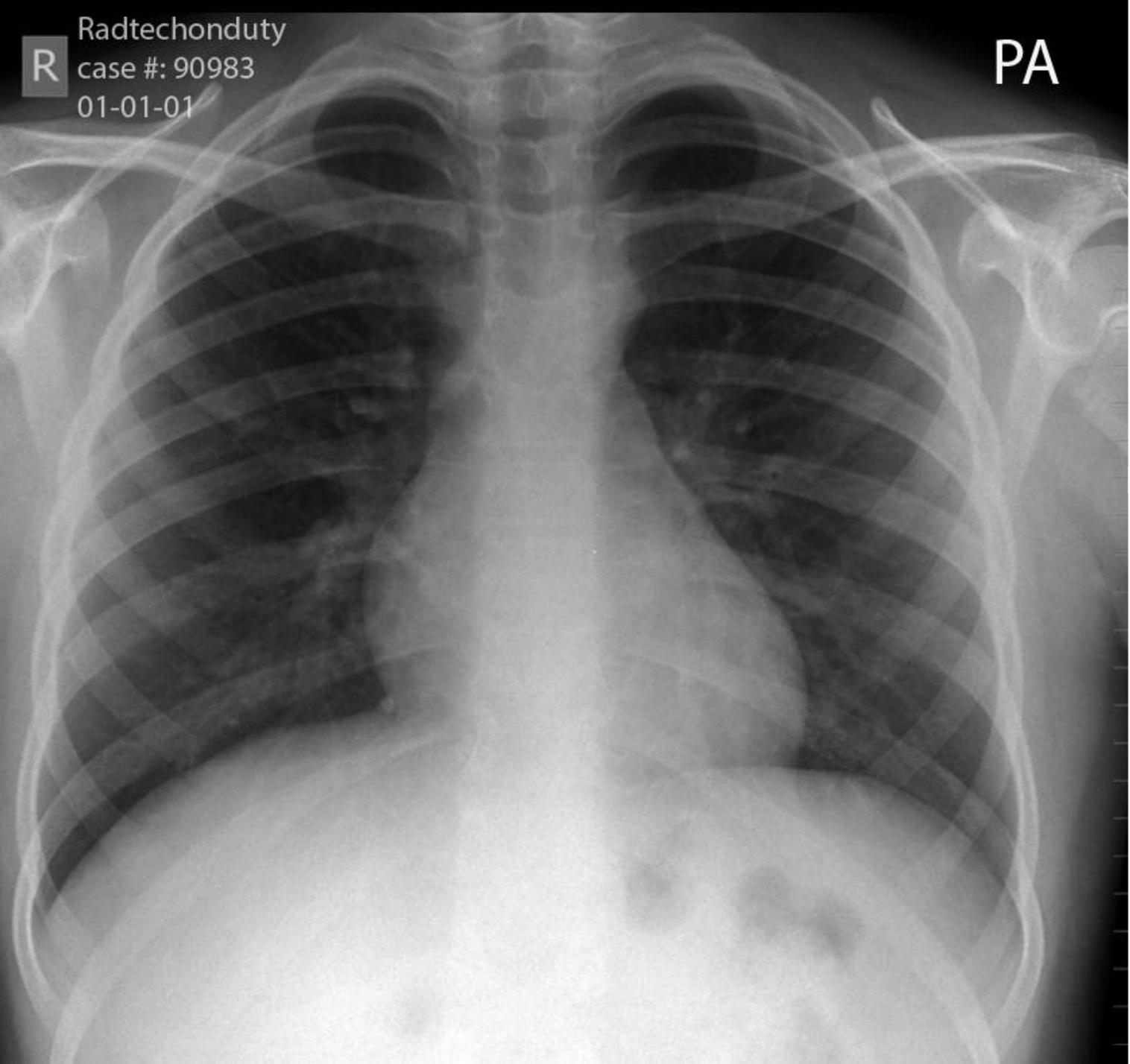
**WRIST
X-RAY**

**KNEE
X-RAY**

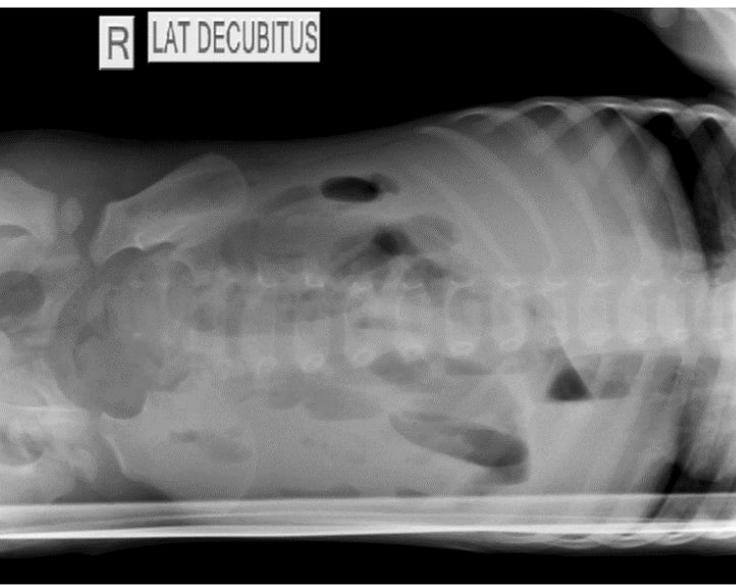
**CERVICAL
SPINE X-RAY**

R Radtechonduty
case #: 90983
01-01-01

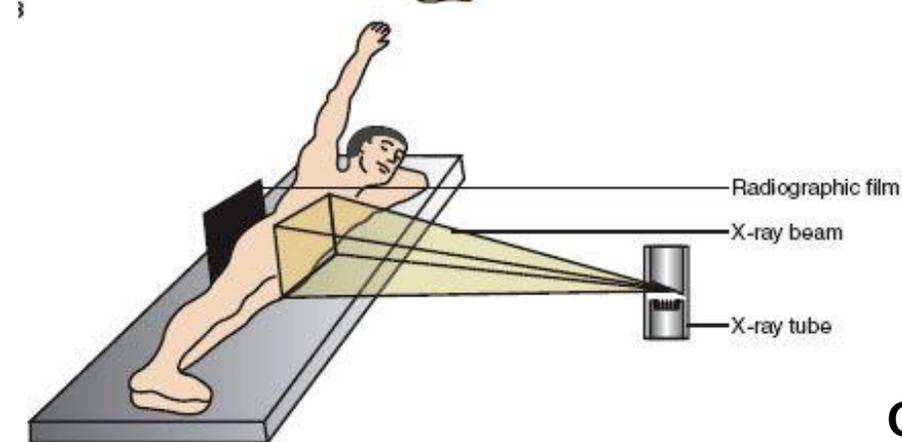
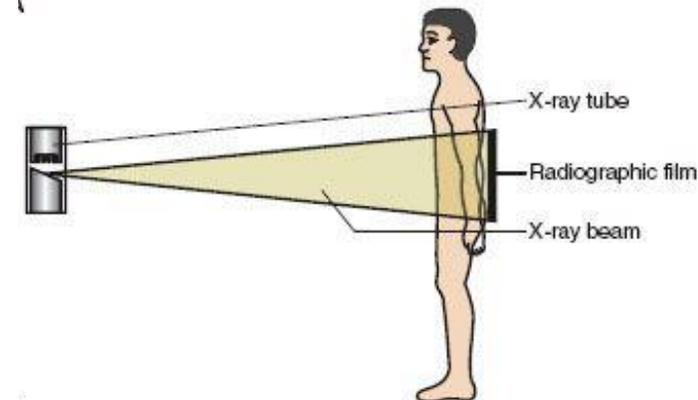
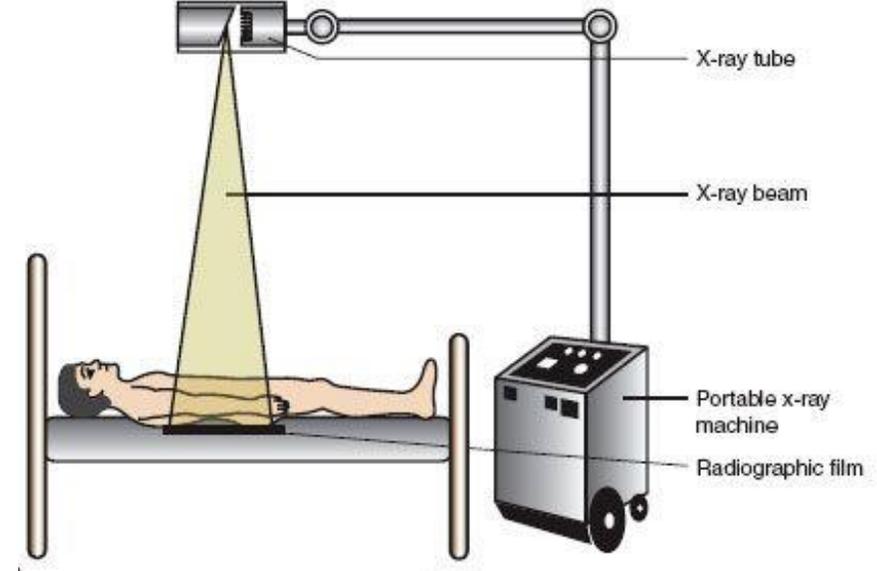
PA



GO BACK



DIFFERENT POSITIONS FOR ABDOMEN X-RAY



GO BACK

**KUB IS: X-RAY OF THE ABDOMEN
AND PELVIS FROM THE LOWER
COASTAL MARGIN TO SYMPHYSIS
PUBIS**

(AREA OF **KIDNEY, **U**RETER,
BLADDER)**

**USUALLY AFTER PREPARATION
WITH LAXATIVES AND FASTING FOR
AT LEAST 6 HOURS. ITS USED TO
DETECT ANY RENAL STONE OR
BEFORE IVP STUDY (DISCUSS
LATER).**





[GO BACK](#)

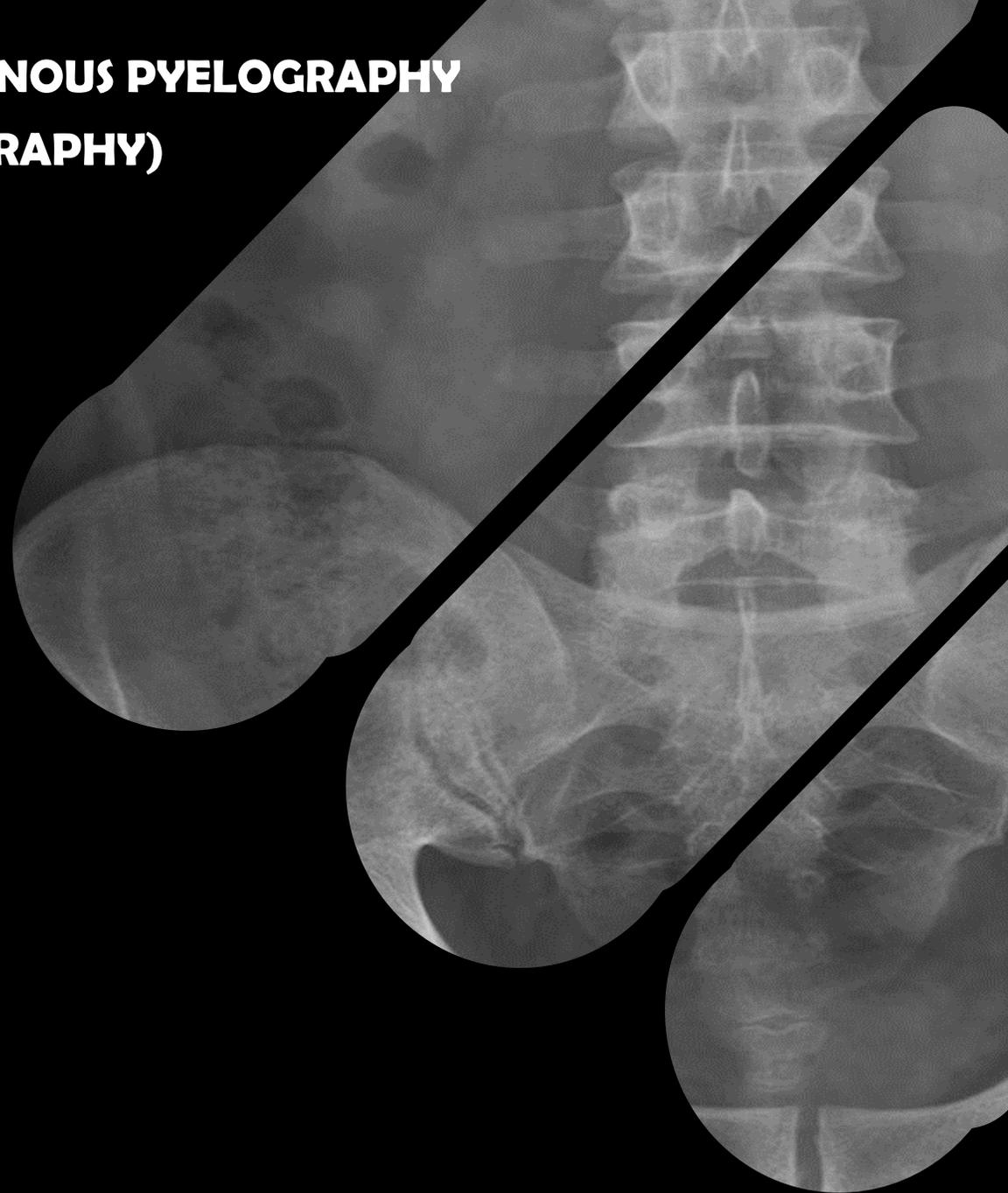




2 .IVP (IVU) (INTRAVENOUS PYELOGRAPHY OR UROGRAPHY)

WHAT IS IVU OR IVP?

IT IS A STUDY OF THE PELVIS OF KIDNEYS, URETERS, AND URINARY BLADDER



PROCEDURE

1.WE START WITH KUB

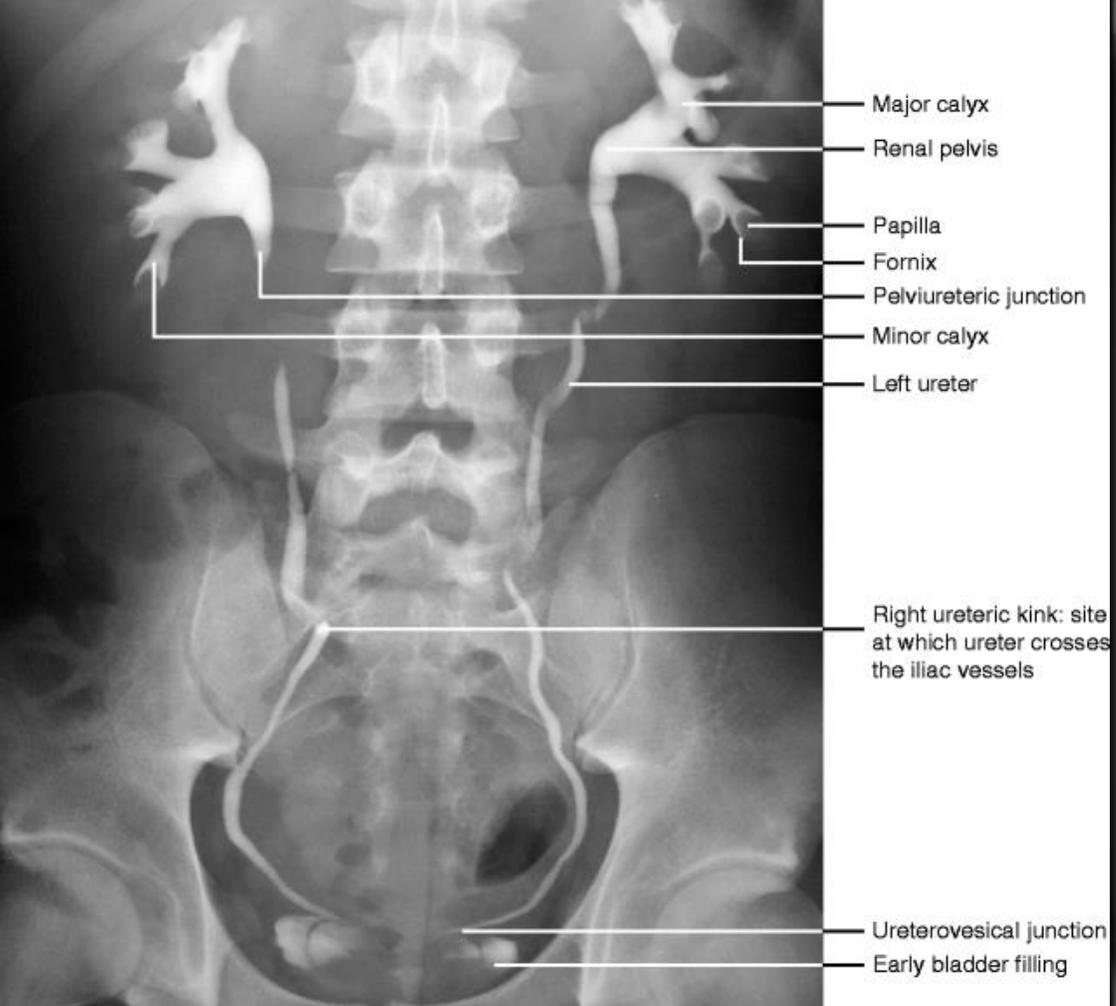
2.AND THEN GIVE THE
PATIENT CONTRAST
MEDIA I.V
(INTRAVENOUSLY)

4.AND CONTINUE AS
EACH CASE REQUIRED.

3.THEN DO XRAY AT
DIFFERENT
DURATIONS (
IMMEDIATE, 5MIN,
10MIN,...)

5 MIN FILM





**IVU 15 MIN FILM
(REVIEW ANATOMY)**

EXAMPLES OF PATHOLOGY OF IVP (NO DETAILS)



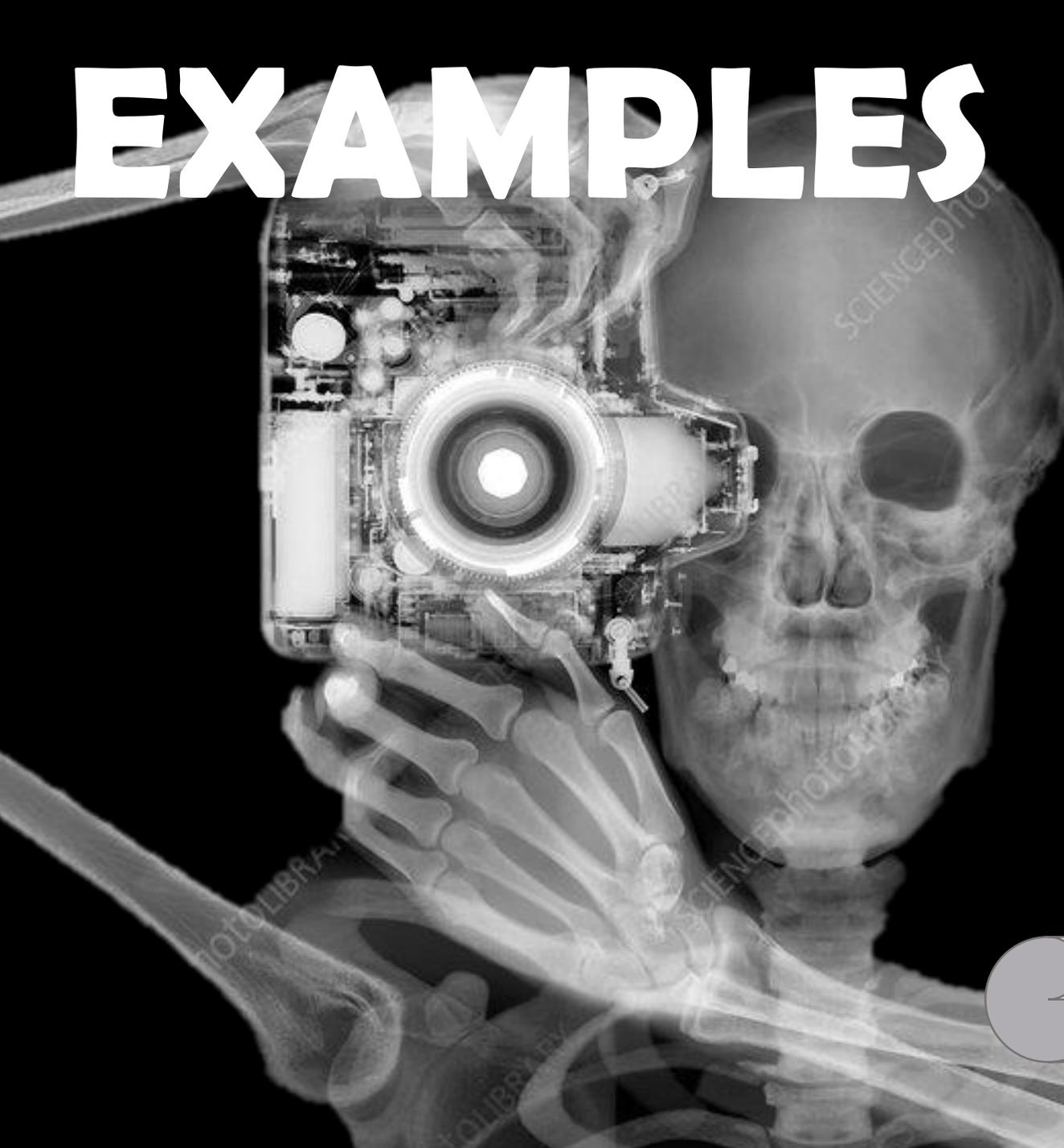
3-FLUOROSCOPY

WHAT IS A FLUOROSCOPY?

IT IS A DYNAMIC XRAY (VIDEO LIKE)
WITH CONTRAST MEDIA GIVEN TO
THE PATIENT



EXAMPLES



BARIUM SWALLOW (ESOPHAGUS)

BARIUM MEAL (STOMACH)

**BARIUM FOLLOW THROUGH
(SMALL BOWEL)**

BARIUM ENEMA (LARGE BOWEL)

**HYSTEOSALPINGOGRAPHY
(UTERUS)**

URETHROGRAPGY (URETHRA)

**MCUG (MICTURATION CYSTO
URETHROGRAM) URINARY
BLADDER**

BARIUM SWALLOW

TAKING IMAGES WHILE THE PATIENT IS SWALLOWING THE ORAL CONTRAST MEDIA
UPPER (LATERAL AND AP):



BARIUM SWALLOW

LOWER LEVEL (AP AND LATERAL)



BARUIM MEAL

TAKING IMAGES WITH DIFFERENT VIEWS WHILE THE ORAL CONTRAST IN THE STOMACH

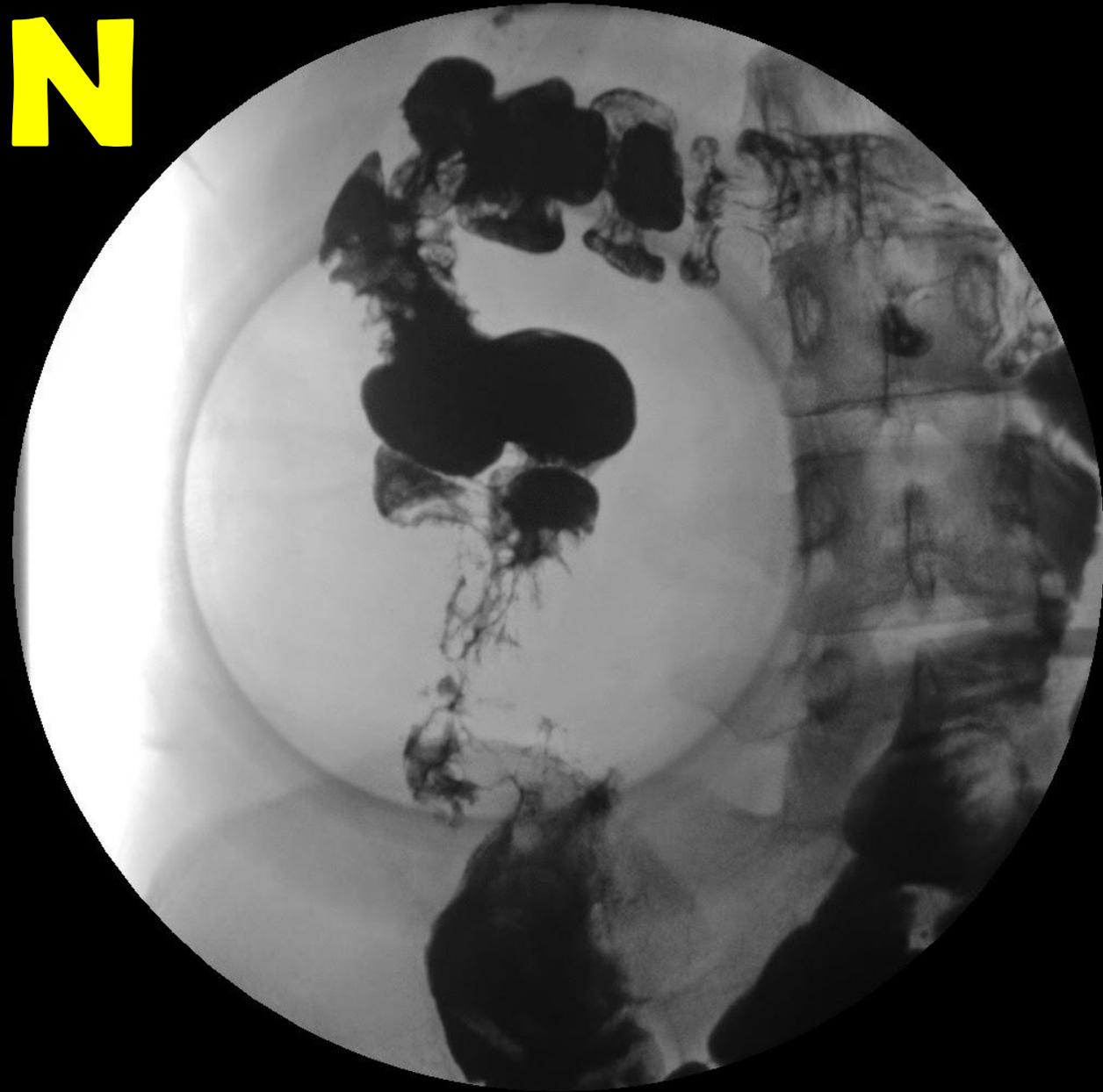


FOLLOW THROUGH

WE GIVE ORAL CONTRAST BARUIM AND WE TAKE XRAY FILMS ON DIFFERENT TIMES FOR EXAMPLE : EVERY 20 MINUTES IN THE FIRST HOUR , EVERY 30 MINUTES IN THE SECOND HOUR EVERY 60 MINUTES TILL REACHING THE TERMINAL ILEUM , THEN WE DO COMPRESSION VIEW UNDER FLOUROSCOPE GUIDANCE TO EXAMINE TERMINAL ILEUM



**COMPRESSION
VIEW
BARUIM
FOLLOW
THROUGH**



BARUIM ENEMA

THROUGH RECTAL TUBE
WE INTRODUCE
BARUIM CONTRAST UNDER
FLOUROSCOPY GUIDANCE
TO LARGE BOWEL ONLY



MCUG

(MICTURATION CYSTO URETHROGRAM)

1. USUALLY USED TO
DETECT VUR (VESICO
URETERIC REFLUX)

2. WE INTRODUCE
NICM (NON-IODINATED
CONTRAST MEDIA)
THROUGH FOLYES
CATHETER TO THE
URINARY BLADDER.

3. THE CONTRAST
MEDIA SHOULD FILL
THE URINARY
BLADDER WITHOUT
RETROGRADE
PASSAGE TO THE
URETERS

4. IF THERE IS INFLUX
OF CONTRAST MEDIA
TO URETERS IT IS
CALLED VUR (VESICO
URETERIC REFLUX)



**NORMAL
MCUG**



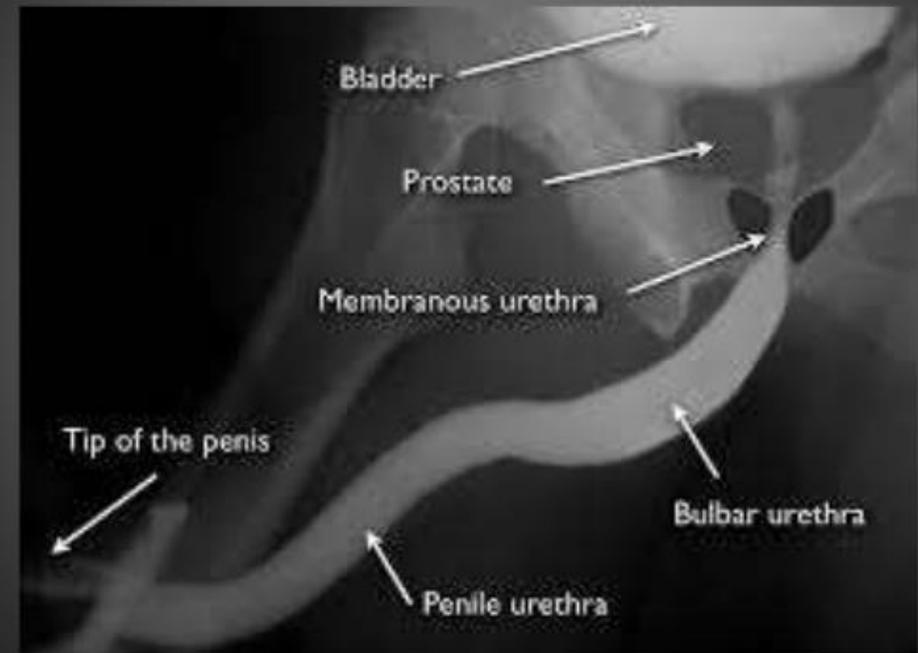
**VUR IN MCUG
ABNORMAL**

URETHROGRAM

WE INTRODUCE NICM THROUGH FOLYES CATHETER (IT'S BALLON IN THE TIP OF THE PENIS) TO SEE IF THERE IS ANY STRICTURE OR RUPTURE IN THE URETHRA



Radiographic anatomy on RGU



HYSTEOSALPINGOGRAPHY

INTRODUCE NICM THROUGH A CATHETER OR LONG CANULA TO THE UTERUS, MAINLY TO DETECT ANY BLOCKAGE OF FALLOPIAN TUBES





4-ULTRASOUND

ABOUT ULTRASOUND

ULTRASOUND

ADVANTAGES

NO HARMFUL RADIATION
EXPOSURE

NOT EXPENSIVE

AVAILABLE

BEST METHOD FOR
HYDRONEPHROSIS AND
GALL BLADDER STONE

ABOUT ULTRASOUND

ULTRASOUND

DISADVANTAGES

OPERATOR DEPENDANT

LIMITATION TECHNICAL
FACTORS BY OPACITY,
INCOOPERATIVE
PATIENT, EXCESSIVE
GASES,...

EXAMPLES

KIDNEY ULTRASOUND , THYROID ULTRASOUND, LIVER ULTRASOUND



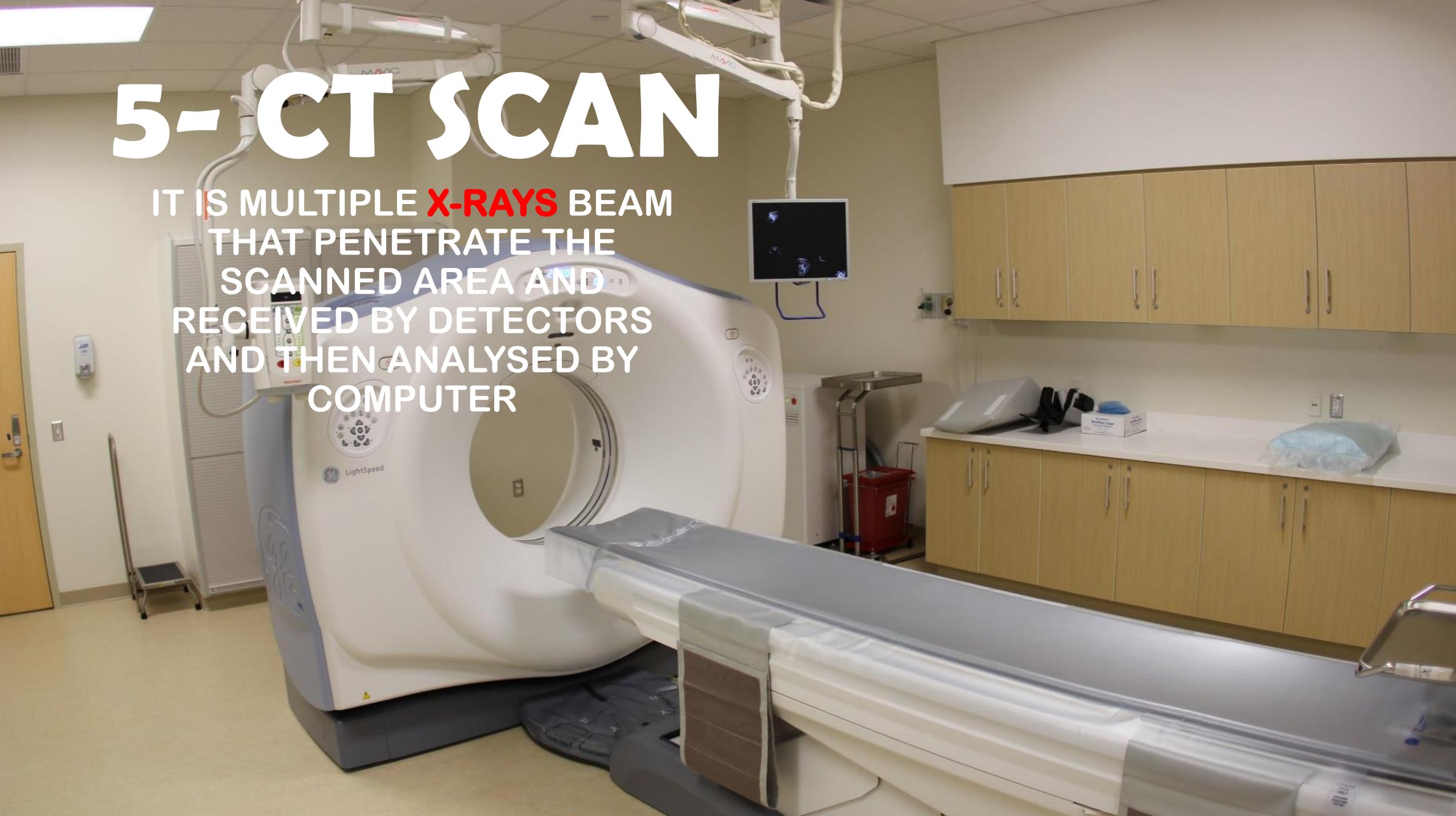
0"

5"

10"

5- CT SCAN

IT IS MULTIPLE **X-RAYS** BEAM THAT PENETRATE THE SCANNED AREA AND RECEIVED BY DETECTORS AND THEN ANALYSED BY COMPUTER



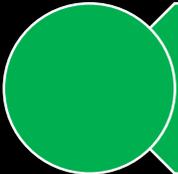
PROS

CONS

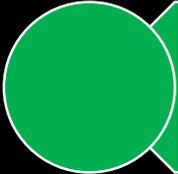
ADVANTAGES



RAPID SCAN



**FIRST CHOICE FOR TRAUMA CASES ,AND
BRAIN INSULT**



**BEST METHOD FOR CALCIFICATION AND
FRACTURES**

DISADVANTAGES

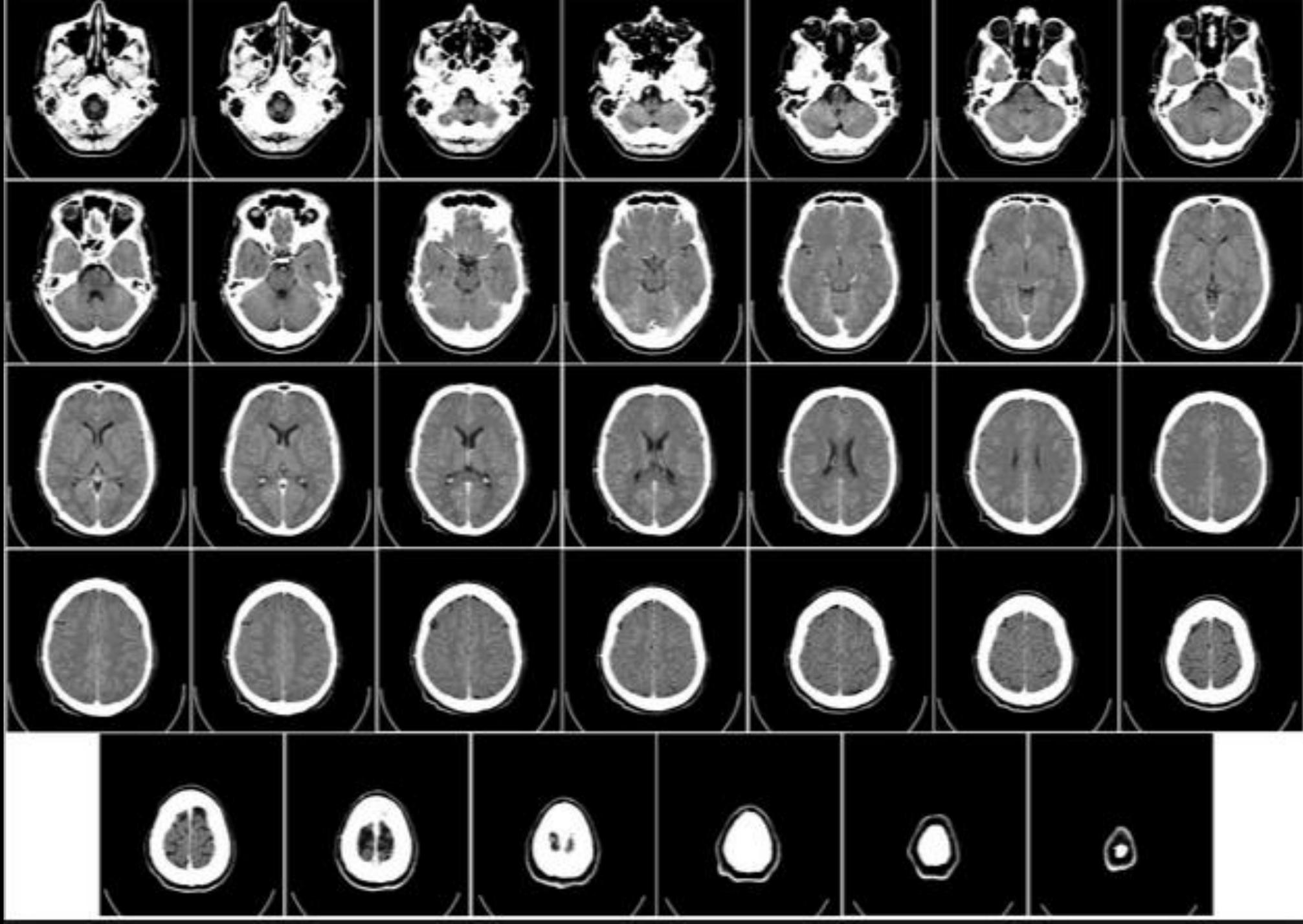
HIGH EXPOSURE DOSE

COSTY

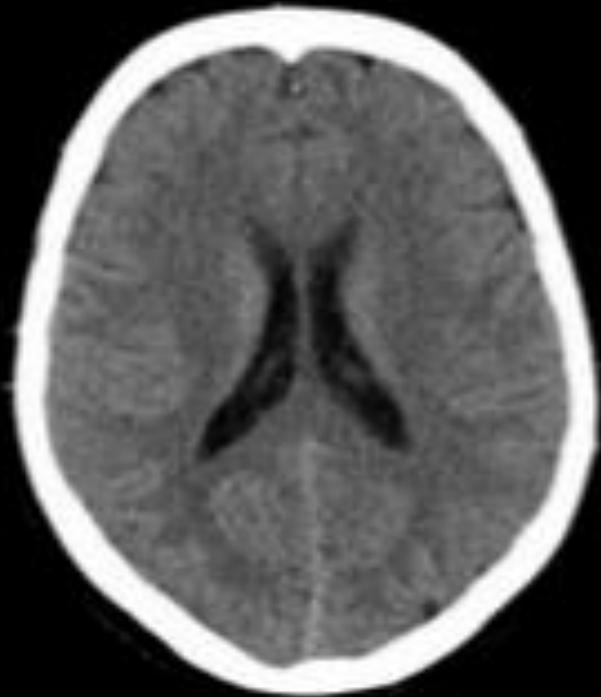
LESS DIAGNOSTIC INFORMATION THAN MRI

NOT ALLOWED FOR PREGNANT LADIES

IT IS NOT
ONE IMAGE
IT IS A FILM
OF MANY
IMAGES IN
DIFFERENT
LEVELS

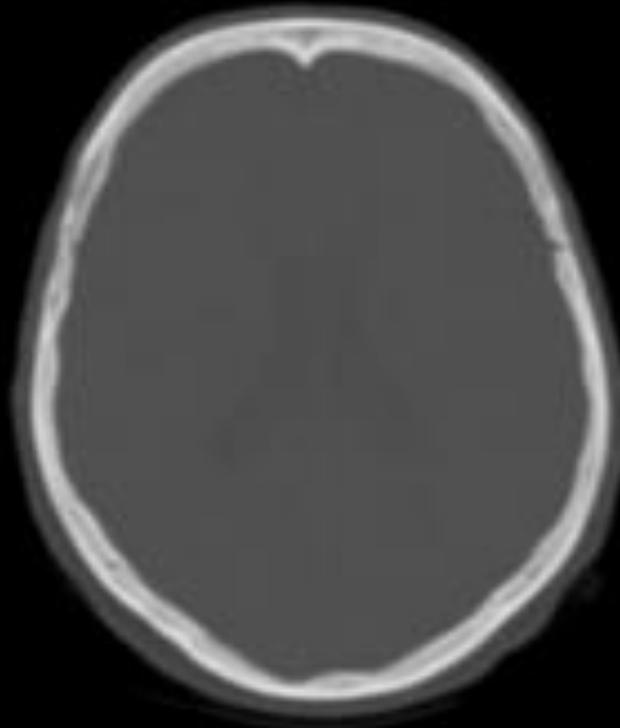


WINDOWS (IT IS TECHNICAL OPTION , WE SCAN THE PATIENT ONLY ONCE)



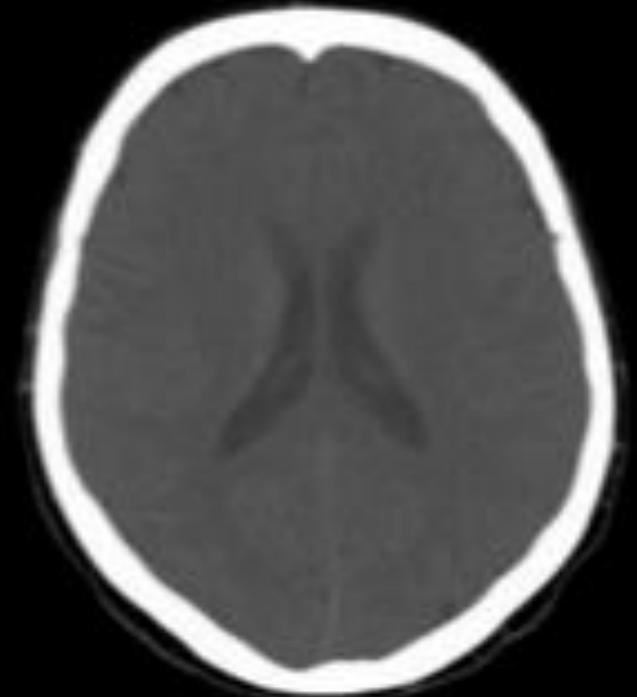
BRAIN window

W:80 L:40



BONE window

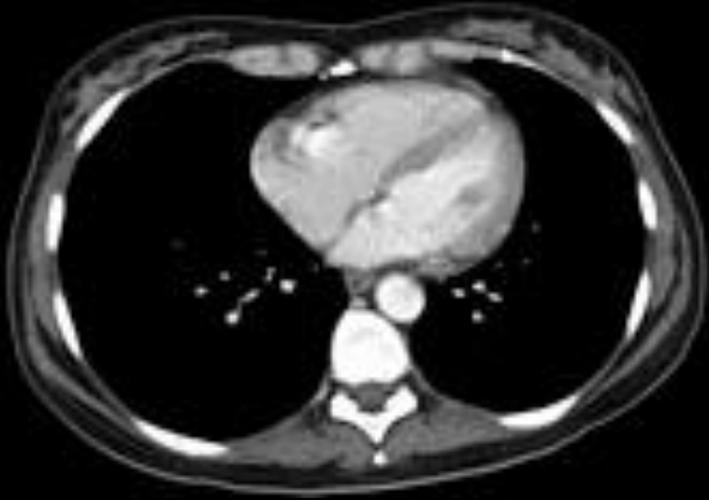
W:2500 L:480



SUBDURAL window

W:350 L:90

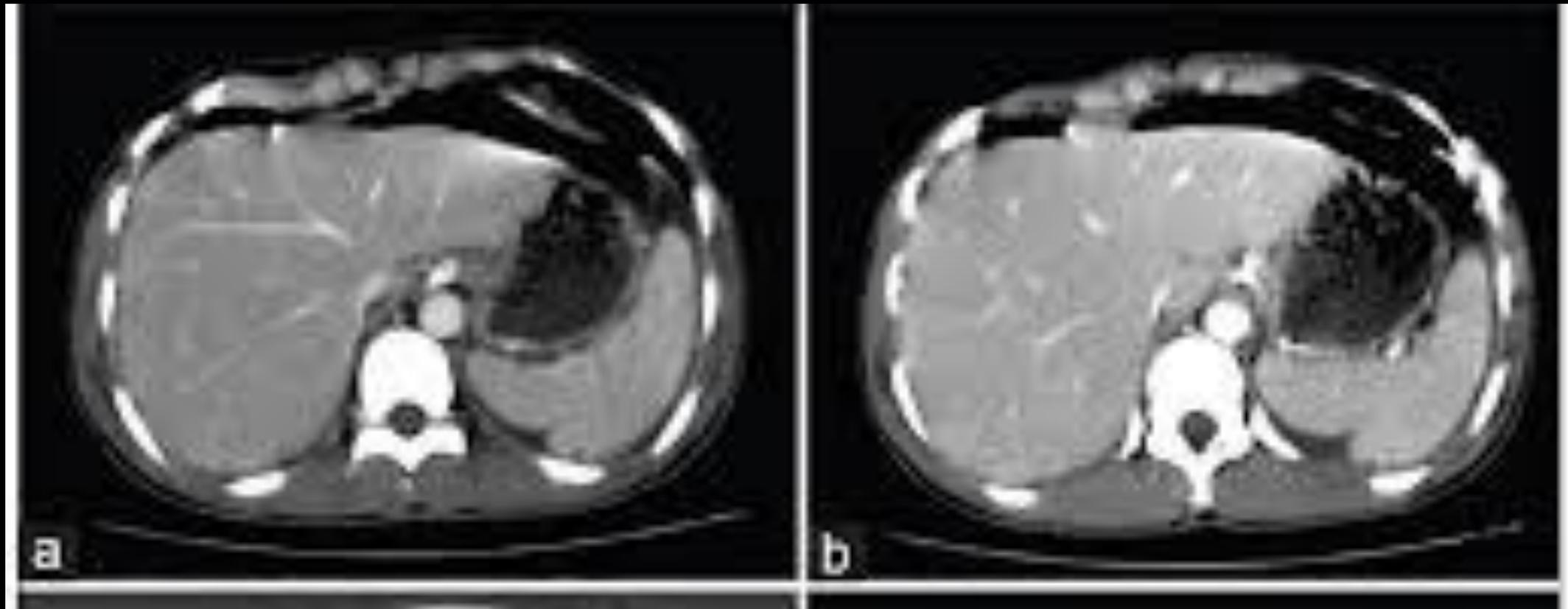
MEDIASTINAL WINDOW



LUNG WINDOW OF CHEST CT



LIVER (SOFT TISSUE) WINDOW



6- MRI

MRI IS A LARGE VERY STRONG
MAGNETIC FIELD THUS IT IS NOT
ALLOWED TO ENTER ANY
FERROMAGNETIC OBJECT TO MRI
ROOM AT ALLLLLLLLLLLLLLLLLL

YOU HAVE TO TAKE GOOD
HISTORY FROM THE PATIENT WITH
HIS DOCUMENTED SIGN THAT HE
HAS NO "MRI NON COMPATIBLE "
PROSTHESIS OR PACEMAKER
(DOCUMENTED)



MRI ACCIDENTS



ADVANTAGES OF MRI

VERY SENSITIVE
FOR EARLY BRAIN
ISCHEMIA
DIAGNOSIS .

NO RADIATION
EXPOSURE.
HOWEVER PREGNANTS
IN THE FIRST
TRIMESTER ARE NOT
ALLOWED TO HAVE MRI
BECAUSE OF LACK OF
ENOUGH SAFTEY
(RESEARCH)

HIGH
DIAGNOSTIC
INFORMATION .

DISADVANTAGES OF MRI

IT IS A
RELATIVELY
LONG TIME
FOR
SCANNING 15
MIN – 1 HOUR

NOT
ALLOWED
FOR PATIENTS
WITH (NON
MRI
COMPATIBLE
PROSTHESES)

NOT OPTIMUM
FOR
CALCIFICATION.

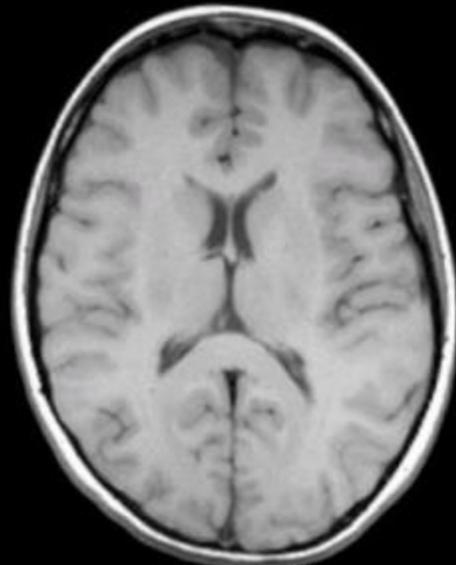
THE MACHINE
HAS A LONG
CLOSED
TUBE THAT
MAY TRIGGER
CLAUSTROPH
OBIA IN SOME
PATIENTS

THE
MACHINE
HAS VERY
VERY LOUD
NOISE.

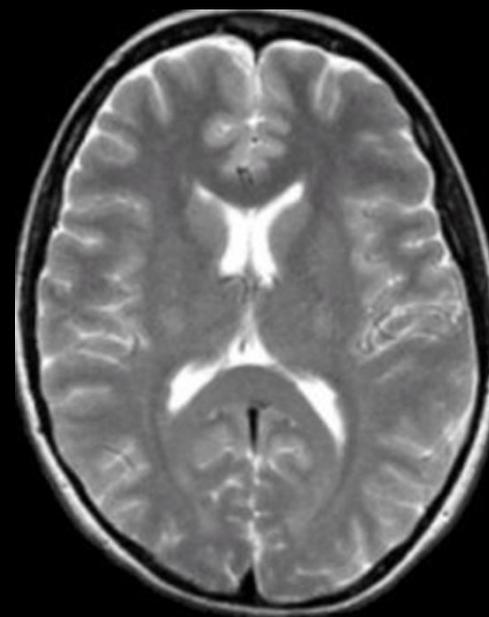
COSTY

**IN MRI WE SCAN THE PATIENT WITH THREE DIFFERENT PLANES
AXIAL CORONAL AND SAGITTAL
ALS IN MANY DIFFERENT SEQUANCES , SO IT TAKES A LONG TIME.**

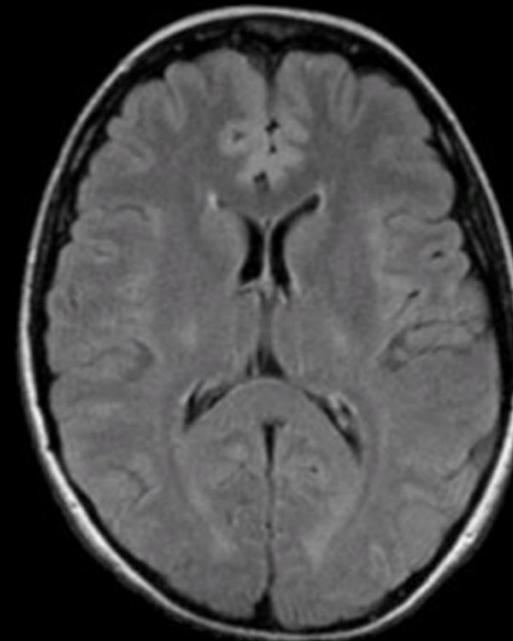
EXAMPLES OF SEQUANCES IN AXIAL PLANE.



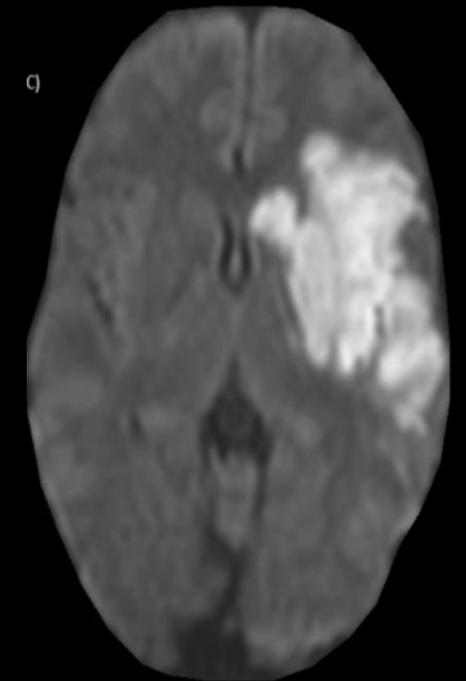
T1-weighted



T2-weighted



Flair



DIFFUSION

7.CONTRAST MEDIA

IT IS A MATERIAL GIVEN ORALLY TO OPACIFYTHE BOWEL OR IV TO
OPACIFY VESSELS OR SOME LINDS OF TUMOR

ORAL

- **BARUIM SULFATE** : USED FOR SWALLOW ,MEAL, FOLLOW THROUGH AND ENEMA , AND IN DILUTED FORM FOR ABDOMEN CT
- IF IT ENTER THE PERTITONEAL CAVITY IT MAY CAUSE SEVERE PERITONITIS SO IT IS NOT USED WHEN THERE IS SUSPECION OF PERFORATION OR LEAK.
- **NICM (NON IODINATED CONTRAST MEDIA)**
- USED AS ORAL CONTRAST FOR CT ABDOMEN TO OPACIFY OWEL
- AND WHEN THERE IS SUSPECION OF PERFORATION OR LEAK

I.V. CONTRAST

- **NICM (NON-IODINATED CONTRAST MEDIA)**

-HISTORY OF ALLERGY MUST BE TAKEN CAREFULLY, IF THERE IS A HISTORY OF ALLERGIES LIKE ASTHMA OR PENICILLIN USE ANOTHER IMAGE MODALITY OR PREPARE THE PATIENT WITH ORAL OR IV CORTICOSTEROID

-CHECK THE KIDNEY FUNCTION TEST

IT IS USED IN CT SCAN AND IVP

GADALUNUIM DTPA USED FOR MRI

OTHER

- INTRAUTERINE CONTRAST IN HYSTEOSALPINGOGRAM WE USE NICM
- IN URETHROGRAM AND MCUG WE USE NICM

RADIOLOGY

