Experiment number 4:

**Effect of grids and air-gap technique on the image**

**Objective:**

To demonstrate the effect of grids and air-gap technique on the image.

**Procedure:**

We will use 35x35 cassette, skull phantom and a grid.

Film one: Using a skull phantomin lateral projection ,**without** a grid, FFD =100cm, OFD=zero (no gap between the object and the film).

Kv= 65 mAs=4

Film two: Using a skull phantom in lateral projection **with** a grid, FFD =as specified on the grid, OFD=zero (no gap between the object and the film).

Kv= 65 mAs=6.30

Film three: Using a skull phantom in lateral projection with a grid, FFD **less** than the stated on the grid =65cm , OFD=zero (no gap between the object and the film).

Kv= 65 mAs (using the inverse square law )= 2.66=2.5

Film 4: Using a skull phantom in lateral projection ,**without** a grid, FFD =130cm, **OFD**=15cm

Kv= 65 mAs=4

Film five: Using a skull phantom in lateral projection with a grid place **upside down**, FFD as specified on the grid, OFD=zero (no gap between the object and the film).

Kv= 65 mAs=6.30

Film 6: Using a skull phantom in lateral projection with a grid placed **off-center**(shifted laterally), FFD =as specified n the grid, OFD=zero (no gap between the object and the film).

Kv= 65 mAs=6.30

What is a Grid?

* Acts as a filter to remove scatter radiation before it hit the film

Grid Structure

* Composed of high x-ray transmitting material and high x-ray absorbing material, each aligned alternately and regularly
* Transmitting material example is aluminium strips
* Absorbing material example is lead strips

Grid Ratio

* Height of lead strips compared to space between strips
* Grid ratio is thickness of grid (simple explanation)

The **thicker** the grid the **less** scatter reaches the film Thicker strips of lead will remove more

scattered radiation but also may remove

more primary radiations, so large

exposure required As the ratio increases the expousure needed increases

***Conclusion:***

Comaring film 1 and 2:

Film 2 (with grid)has :

1- Good contrast

2-more details (sharp)

3- no scattered radiation.

So qulity of film 2 is better.

Comparing film 2 and 3:

Film 2 there is no grid cut off because the distance used is optimum

Film 3 there is grid cut off because the distance used is less than the distance that should be used with this grid.

So image 2 has good quality, image 3 bad quality.

Film 4:

Air-gap technique, the quality of the inage is good due to the space between the phantom and the film so scattered radiation is reduced. BUT there is magnification.

Quality similar to image 2 but there is magnification.

Film five:

There is bilateral cut because the x-rays passed only through the center of the grid.

Bad image quality

Film six:

There is grid cut off.

Bad image quality