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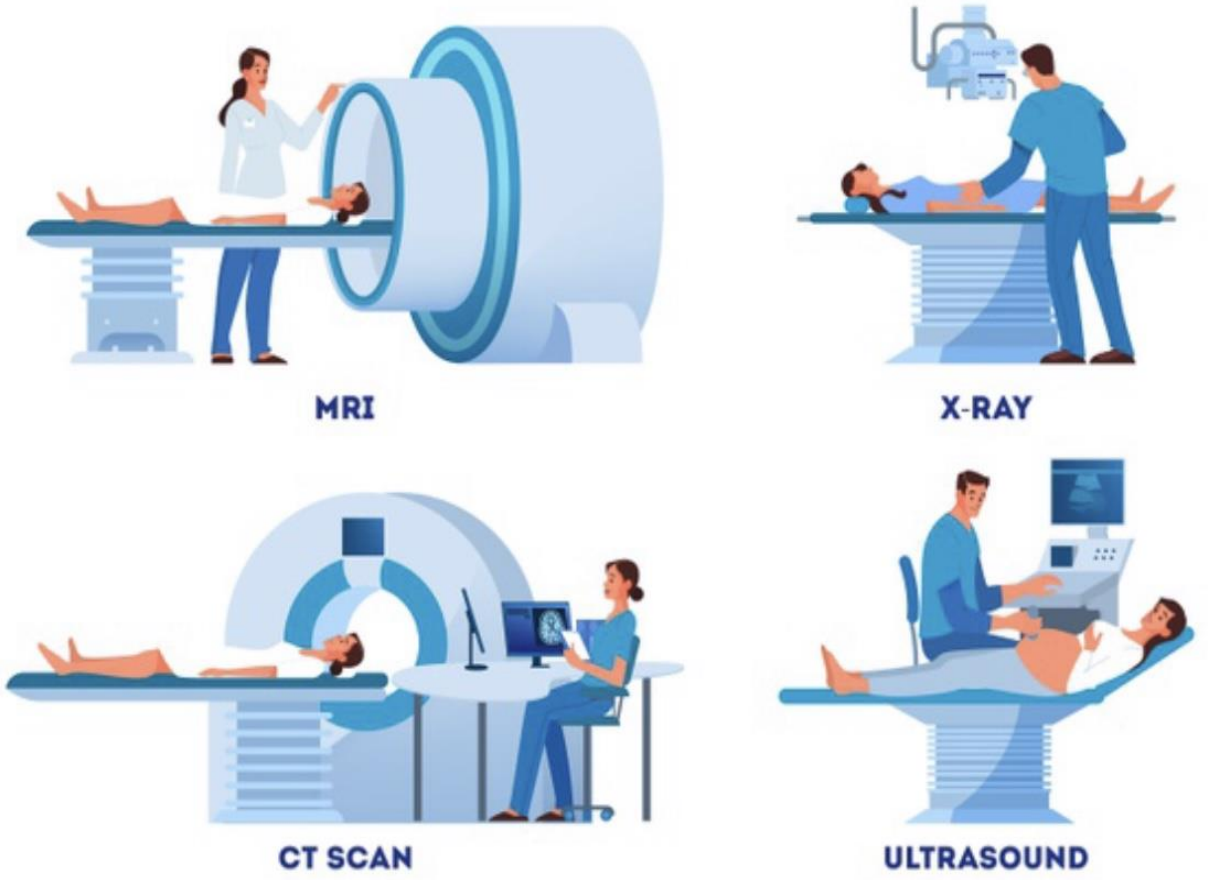
RADIOLOGY MEDICAL DEVICE TECHNIQUE

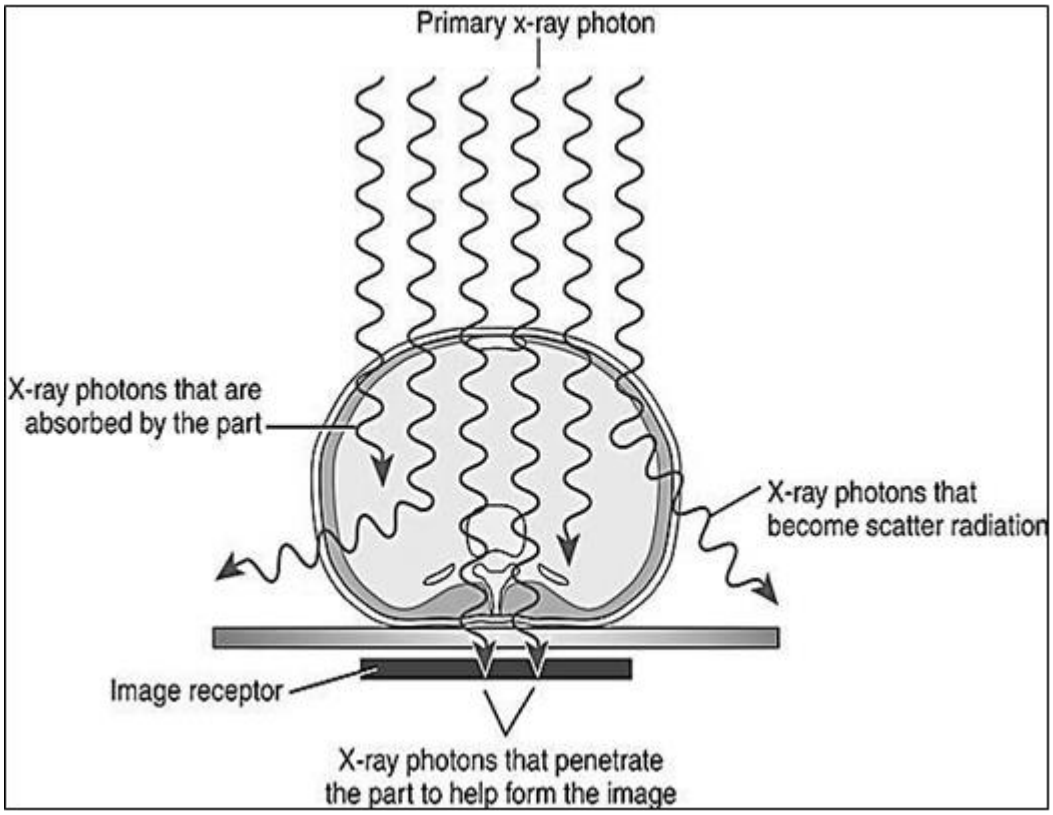
(SECOND STAGE)



The Scatter Radiation and methods of control it

When a radiographic exposure is performed, the primary photons will either:

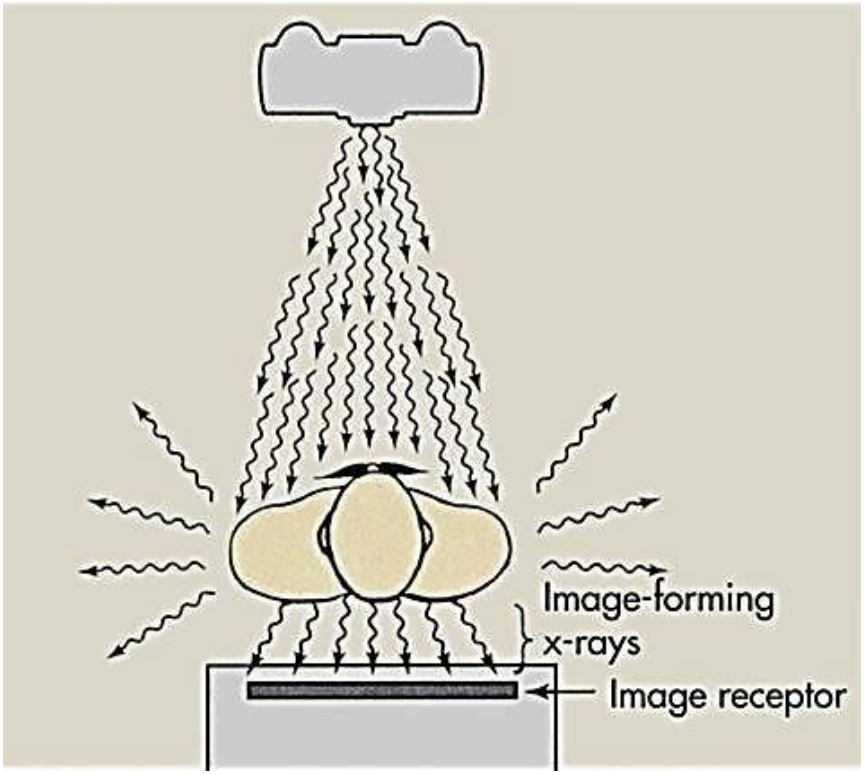
- Pass through the body tissue unaffected. (Without interacting).
- Become absorbed by the tissues within the body.
- Interact with body tissues and change direction (Compton's scatter).



Scatter Radiation

In the case of X-rays, the most common source of scatter radiation for most humans, is the patient, and those scattered rays can continue to scatter around the room Scatter radiation is probably the biggest single factor contributing to decreased film quality. It is

the result of a redirection of the primary x-ray beam and production of new x-rays following the interaction with the patient. Therefore, scatter radiation is present in each radiographic examination.



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Scatter Radiation Occurs in Three Ways:

- Bulk Scatter radiation. This type of radiation derives from the X-rays bouncing off the patient's body.
- Back scatter. This type of scatter radiation is created from behind the film and directed back towards the X-ray tube. To prevent backscatter,
- Side scatter. Side scatter is caused by objects in the immediate areas, such as walls, floors and tables. To mitigate side scatter, the X-ray rooms are typically void of other objects and the table is located in the center of the space.

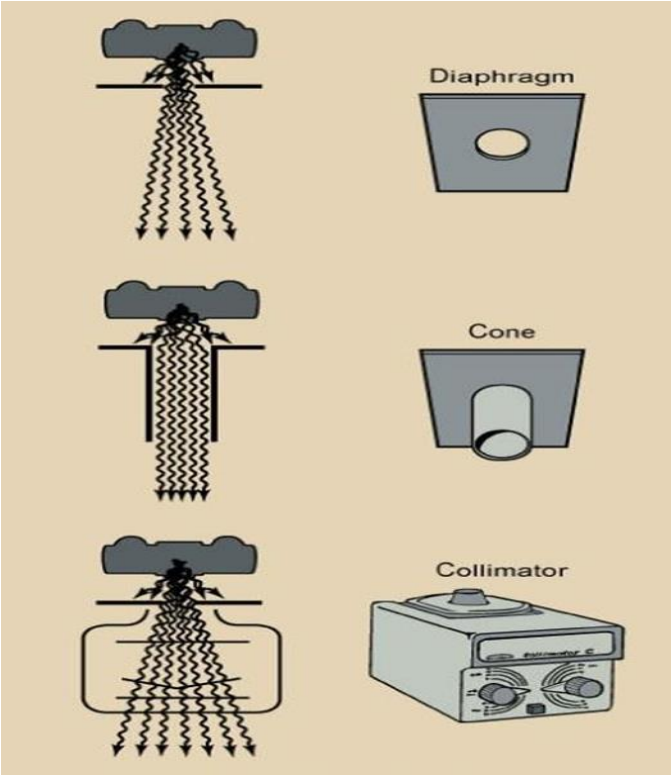
Factors contribute to an increase in scatter are:

- Increased kVp
- Increased x-ray
- Increased patient thickness

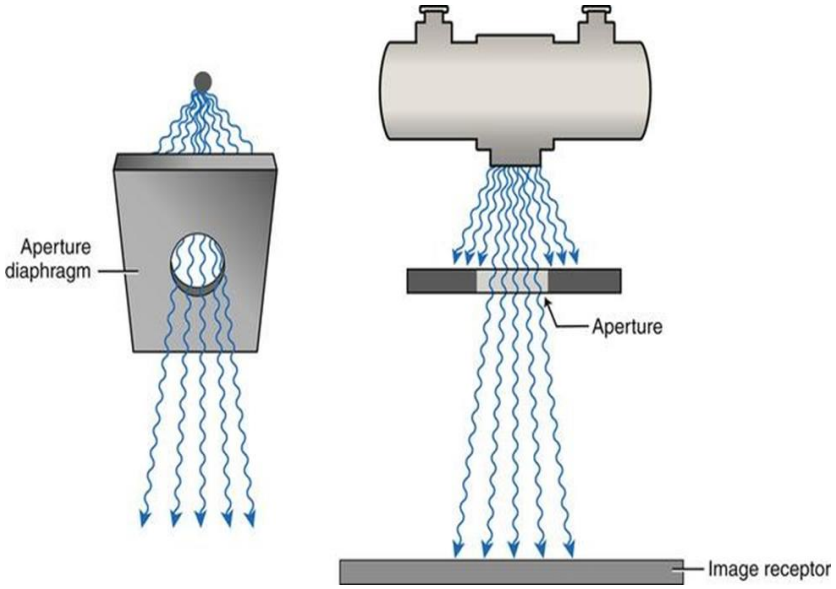
Control of Scatter Radiation

The x-ray field extends and goes beyond the boundaries of the anatomic area of interest and incident radiation size, resulting in increasing the amount of scatter radiation reaching the incident radiation and unnecessary patient exposure. So, the x-ray beam field size must be limited to the anatomic area of interest. Technologists routinely use many types of devices such as:

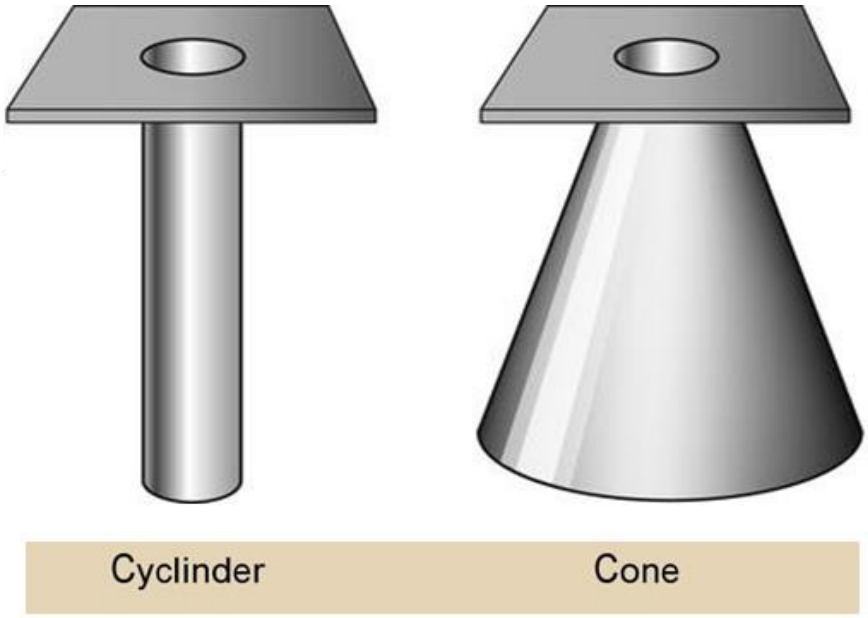
beam-restricting devices, which include: Aperture Diaphragm, Cones & Cylinders



- Aperture Diaphragm: The simplest of all beam limiting devices. It is a flat piece of lead or lead-lined metal diaphragm attached to the head of an x-ray tube with a hole in it. It is placed directly below the window of the x-ray tube.



- Cones & Cylinders: They are centered on the tube directly below the window. Cones have a special disadvantage compared to cylinders. Cylinders are generally considered more useful than cones.



- Variable Aperture Collimator: The most complex, useful and acceptable beam limiter is the variable aperture light positioner. This makes the collimator adjustable because it can produce projected fields of different sizes. The collimators are equipped with a white light source and a mirror to illuminate the patient. This light is intended to indicate precisely where the initial x-ray beam will be projected during exposure.