

X – Ray machine

X-rays from nature come from extraterrestrial sources, such as distant suns and stars, however these x-rays simply contribute to background radiation that is all around us. The ground and soil are also sources of natural background radiation. Depending on where a person lives will determine how much exposure they will receive from natural background radiation sources, however this type of exposure is typically not dangerous. Medical x-rays come from a machine that is designed to emit radiation on command.

Classical x-ray radiography creates darkness pictures of anatomy based on x-ray absorption. The goal of the x-ray machine is to generate enough intensity of electron flow in a controlled manner to produce an x-ray beam of specified amount and quality. The region from which the x-rays are generated is nearly a point source, and they are next focused on the body to be imaged. The x-rays that are emitted by the anatomy are detected to create a two-dimensional image, where each point's intensity refers to the x-ray intensity there. The ability to produce images depends on how many x-rays can pass through the human body and how differently absorbing different area of the body.



Fig (1): The body's absorption of X-rays

X – Ray machine shape & size:

The many different types of x-ray machines are usually identified according to either the energy of the x – rays they produce or the purpose for which those x – rays are identified. Diagnostic x-ray machines come in many different shapes & sizes, they are usually operated at a maximum voltage ranging from 25 to 150 kvp and at tube currents from 100 to 1200 mA.

Any x-ray imaging system that is used must have a patient-supporting examination table. If flat or curved, the examination table must be consistent in thickness and as x-ray transparent as necessary. Strong and not very good at absorbing x-rays are carbon fiber tables. This lowers the radiation dose to the patient. Most patient couches are either motorized or floating, making it simple for the radiologic technologist to unlock and move them. A hole to accommodate a thin tray for a cassette and grid is located just underneath the table.

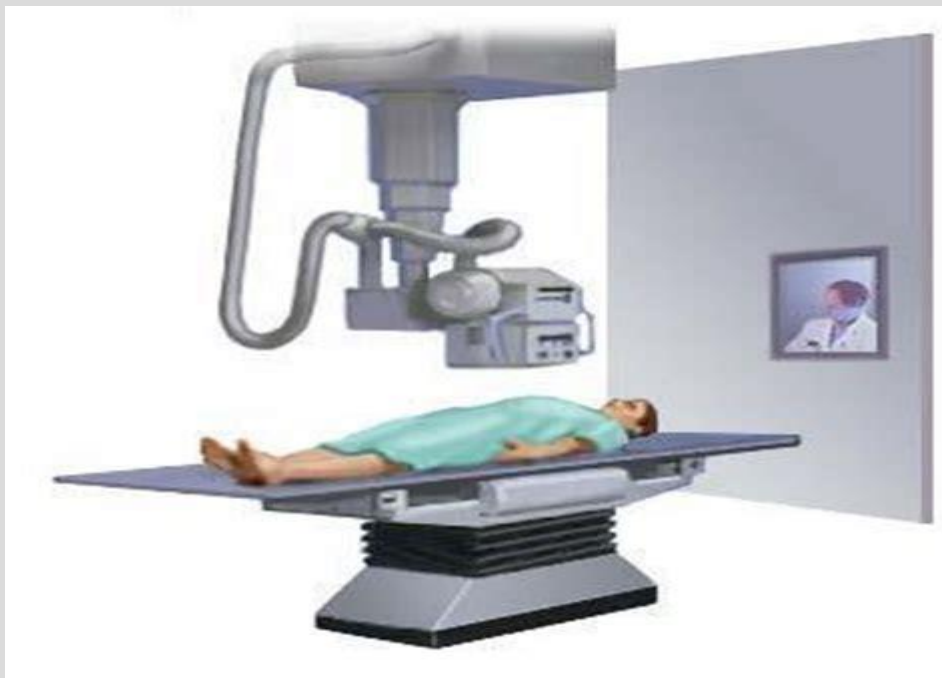


Fig (2): X-ray table

Principle parts of X – ray machine:

Every x-ray machine, regardless of its design, has three principle parts:

- *The x – ray tube
- *The control console
- *The high – voltage section or generator

In of x-ray apparatus, such as dental and portable machines, these three components are housed compactly. Most, however, have the head of the x-ray tube located in one room , the control console in an adjoining room, and a protective barrier separating the two.

The protective barrier must have a window for viewing the patient during examination. the high – voltage generator may be housed in a cubicle container , perhaps 1 m on a side , located in the corner of the examination room.



fig (3): Dental and portable machines