

Medical Imaging

LECTURE FIVE

Plain Radiograph/X-ray

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Introduction

Plain radiograph/X-ray is the imaging of parts of the body, using X-rays, which represent the simplest medical images created through X-radiation. In plain radiograph/X-ray, a beam of X-rays, produced by an X-ray generator, is transmitted through an object, e.g. the part of the body to be scanned. The X-rays are absorbed by the material they pass through in differing amounts depending on the density and composition of the material.

Properties of Plain Radiograph/X-ray

- (i) Simplest medical images created using X-radiation
- (ii) Provides fast
- (iii) High-resolution images
- (iv) Low-cost (relatively inexpensive)
- (v) Does not require special preparation for the patient
- (vi) plain X-rays are pictures of the chest and pictures of the arms, legs or spine in patients who have problems in the bones, joints.

Components of a Plain Radiograph/X-ray System

An X-ray spectrum with different energies is produced in a vacuum tube made of glass when an electron beam, emitted by a cathode, is fired at target material called an anode. The X-ray spectrum depends on the anode material and the accelerating energy of the electron beam. Most standard X-ray systems have many components which are;

- (i) **X-ray tube** is an electrical device used for generation of X-ray, which constant from glass tube, cathode, and anode.
- (ii) **X-ray detector (receptor):** are devices used to measure the flow, locative distribution, spectrum, and other properties of X-rays.