

Introduction To Image Interpretation

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WHAT IS MEDICAL IMAGING?

- ***Medical imaging is the technique and process of creating visual representations of the interior of a body.***
- As a discipline and in its widest sense, it is part of biological imaging and incorporates radiology which uses the imaging technologies of X-ray, MRI, ultrasound, Endoscopy, and nuclear imaging techniques as (PET) and (SPECT)

USES OF DIAGNOSTIC IMAGING

- for **clinical analysis and medical intervention**, as well as **visual representation of the function of some organs or tissues**.

A large, faint watermark logo of Galgotias University is centered on the slide. It features a stylized 'G' with a gradient from yellow to red, set within a circular frame.

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Medical Imaging Reveals

- Medical imaging **seeks to reveal internal structures** hidden by the skin and bones, as well as to **diagnose and treat disease**.
- Medical imaging **establishes a database of normal anatomy and physiology to make it possible to identify abnormalities**.

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HISTORY

- In **1895 Wilhelm Rontgen**, working in the darkened laboratory in Wurzburg, Germany, noticed that a screen painted with a fluorescent material in the same room, but a few feet from a cathode ray tube he had energized and made lightproof, and started to glow(fluoresce).
- Sensing something important has happened, he recognized that the screen was responding to the nearby production of unknown ray transmitted invisibly through the room.

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A NEW KIND OF RAY

- He name the **new rays** x-rays, using the mathematical symbol “x” for something unknown.
- For about 100 years after that, radiographic images survived their brief birth as a burst of ionizing radiation nestled comfortably on a piece of film.
- In some places, film is still used, but it is much less common.
- Today, like in 1895, conventional radiographic images (usually shortened to x-rays) are produced by the **combination of ionizing radiation and light striking a photosensitive surface**, which in turn, produces a **latent image** that subsequently processed.

CONTD....

- At first, the processing of film is carried out in a darkroom containing trays with various chemicals; the films were then, literally, hung out and then up to dry.
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- When an immediate reading was requested, the films were interpreted while still dripping with chemicals and thus the term wet reading for a **stat interpretation** was born.
- Films were then viewed on lighted view boxes (almost always backward or upside down if the film placement was being done as a part of movie or TV show).

CONTD....

- This workflow continued for several decades but it has **2 major drawbacks:**
 - 1) **It required a great deal of physical storage space** for the ever growing number of films. Even though each film is very thin, many films in thousands of patient folders take up a great deal of space.
 - 2) The other drawback was that radiographic films could **physically be in only one place at a time**, which was not necessarily where they might be needed to help in the care of patients.

CONTD....

- So eventually, **digital radiography** came into being, in which the photographic film were replaced by a **photosensitive cassette** or **plate** that could be processed by an **electronic reader** and resulting image could be stored in **digital format**.
- This electronic processing no longer required a dark room to develop the film or a large room to store the films.
- Countless images could be stored in the space of one spinning hard disk on a computer server.

CONTD....

- Even more important the images could be viewed by anyone & anywhere in the world at any time.
- The images were maintained on computer server, where they could be **stored** and **archived** for posterity and from which they can be **communicated** to others.
- This system is referred to as **PACS** which stand for **picture archiving communication and storage**.
- Using PACS system images created using all modalities can be stored and retrieved. Conventionally, computed tomography, ultrasonography, MRI, fluoroscopy , and nuclear medicine are examples of images that can be stored in this way.

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THANK YOU

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