Lecture 4 / Medical imaging:

1. Medical imaging:

- Medical imaging: what is it?

  "Medical imaging is the technique and process of creating visual representations of the interior of a body for clinical analysis and medical intervention, as well as visual representation of the function of some organs or tissues."

  Medical Imaging. Medical imaging refers to several different technologies that are used to view the human body in order to diagnose, monitor, or treat medical conditions.

- **Used to:**

1.Diagnose the disease = diagnostic imaging

2. Plan and monitor the treatment of the disease

3. Clinical specialty: radiology & radiography + medical physics

1.2 Origins of medical imaging: some dates

- 1895: X-ray discovery, Wilhelm C Röntgen
- 1931: invention of cyclotron, Ernest O Lawrence
- 1938: production of Tc 99 m at cyclotron
- 1946: radioisotopes available for public distribution → nuclear medicine
- 1946: discovery of NMR, Felix Bloch and Edward M Purcell
- 1958 – 1967: SPECT images
- Early 1960s: first clinical PET images
- 1972: first CT machine, Godfrey N Hounsfield
- 1976: first MRI images
- 1978: first commercial SPECT systems

1.3 Medical imaging techniques

refers to the different imaging technologies that are used to view the human body in order to diagnose and monitor.

-Each type of technologies provides different information about the area of the body being studied or treated.

- **Medical imaging techniques not using ionising radiation:**

1- Ultrasound Imaging (US Imaging)

2- Magnetic Resonance Imaging (MRI)

3- Infrared imaging

4- Optical imaging

- **Medical imaging techniques using ionising radiation:**

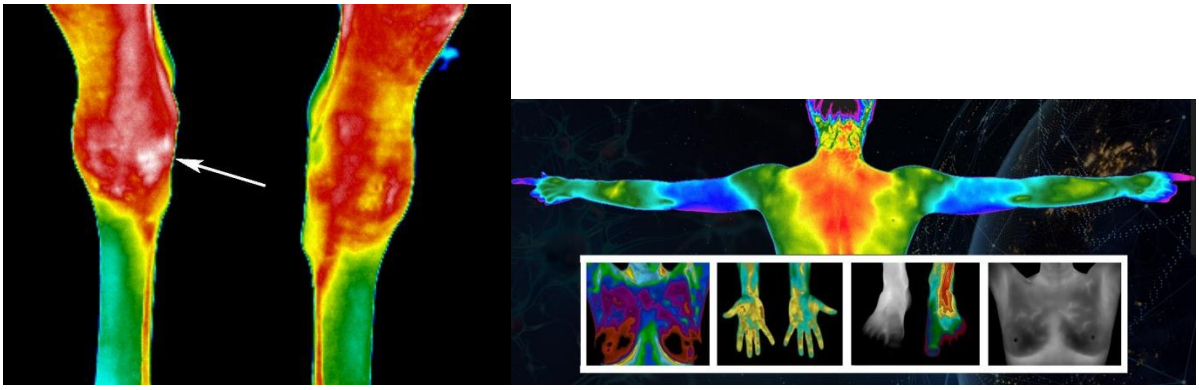
1-Computerized tomography CT-scan and X-ray Imaging

2-Gamma-ray Imaging (SPECT scan)

3- positron emission tomography (PET scans)

4. Scintigraphy

Magnetic Resonance Imaging MRI



Infrared imaging