Gamma detection: scintillator(Anger camera)

Ask Mish

Gamma Camera

Computer

Image displayed here

Lead Shielding

Photomultiplier tubes

Image crystal (NaI)

Collimator

LOJ (2001)

Nuclear Energy (Inside the radioactive nucleus) → Gamma Electromagnetic Energy (The gamma ray has been emitted from the patient) → Light Electromagnetic Energy (The image crystal produces flashes of light) → Electrical Energy (To display the image)
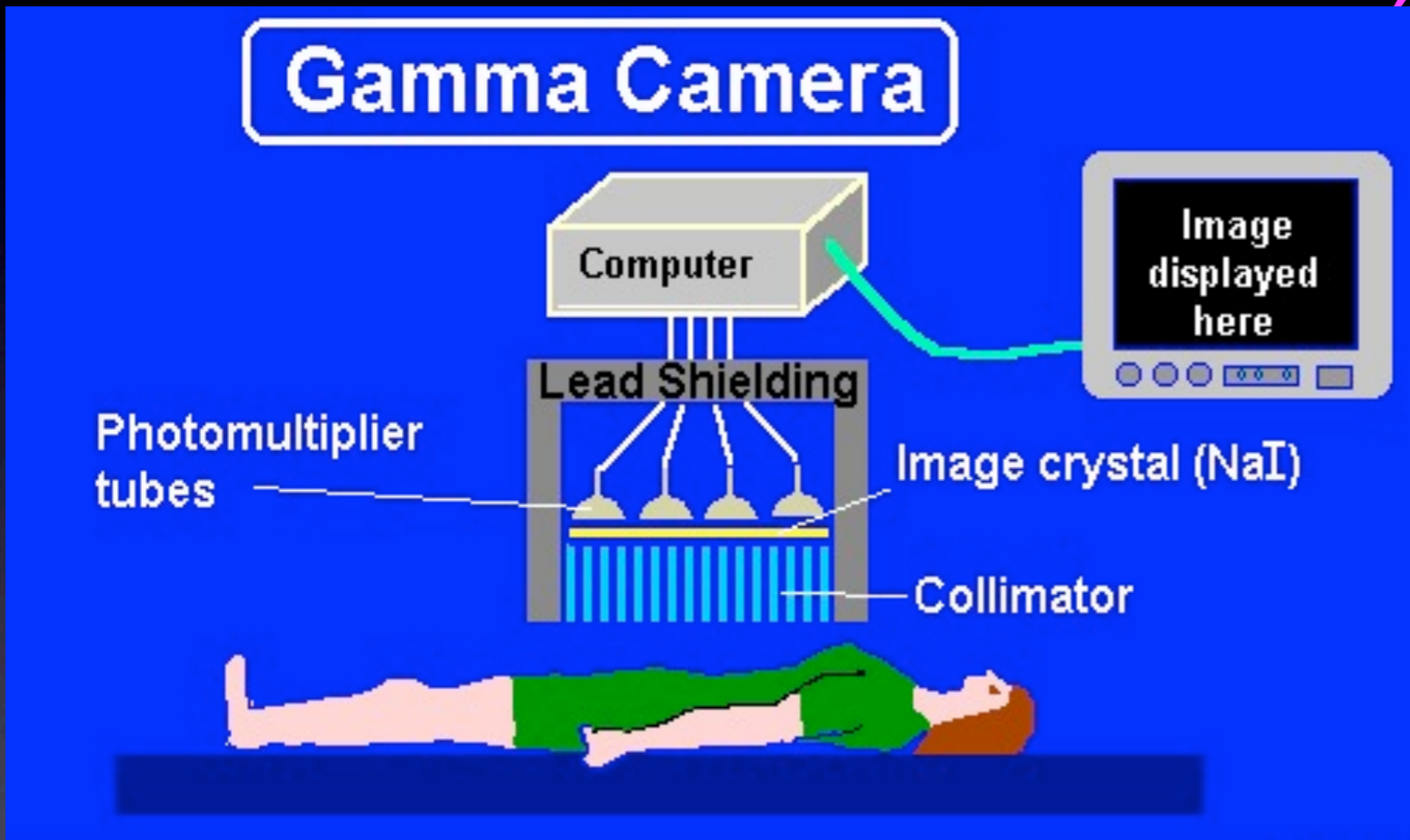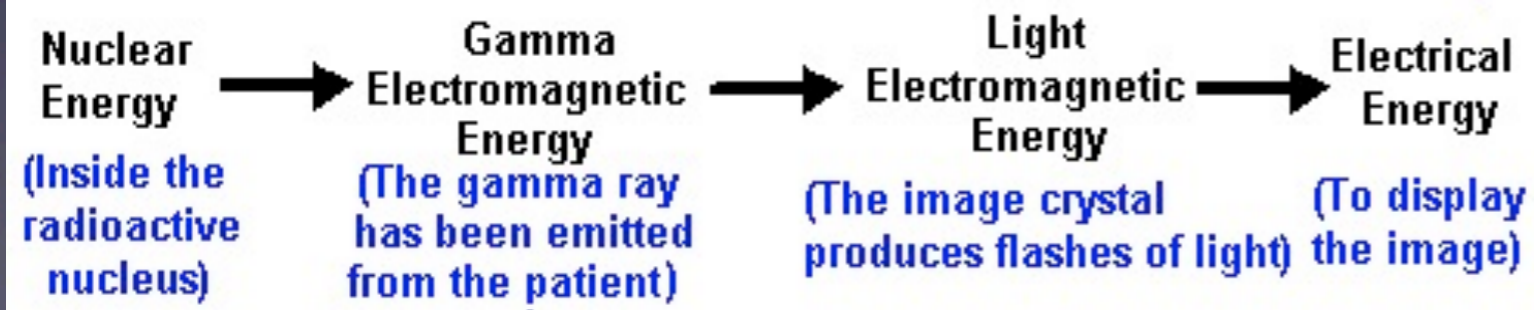
- Principle: photons(gamma) interaction w/ matter made of atoms

- when gamma hits NaI atoms from a crystal it produces photons in the form of green light. This photons are collected and amplified and transformed in a current, then the information read on computer. This device is called scintillator/Anger camera.

- if 2D= scintigraphy, if 3D(rotating camera): SPECT(single photon emission computed tomography)

- Tomography = process of generating a tomogram which is a 2D image of a slice or section through a 3D object. From Greek tomos=slice, section and graphein= to write.

- isotopes used: 80% Tc99m other: Iodine 123, Iodine 131, Ta201 etc for both 2D and 3D (SPECT)

Scintillator vs SPECT scanner vs PET scanner

Scintillator 2D

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SPECT scanner 3D

PET scanner 3D