

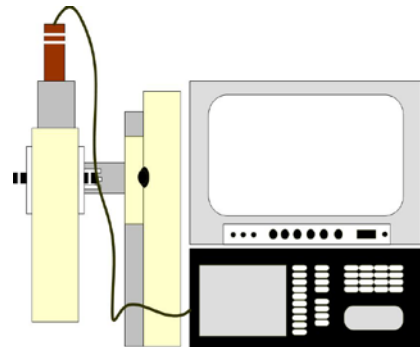
13 Energy calibrator of uptake probe and gamma camera by 黃文正

Aim: Calculation of thyroid Percent Uptake of Radioiodine I-131

¹³¹I Uptake

Materials

- ⊕ Non imaging gamma scintillation probe detector coupled to a photomultiplier tube and electronics
- ⊕ 1 mCi of ¹³¹I, 10 μCi of ¹³⁷Cs
- ⊕ printer



Procedure

1. ¹³⁷Cs is used as standard source. ¹³⁷Cs activity is determined.
2. Room background activity is determined.
3. 1 mCi ¹³¹I of is placed in a Lucite neck phantom and activity counted with the probe detector placed at a standardized distance of 30 cm (24hrs).
4. Detect sample uptake.

$$\%RAIU = \frac{\text{Neck(background correct)counts/min}}{\text{Dose capsule (decay corrected and background corrected) counts/min}} \times 100$$

- ★ Neck (background correct) = Neck counts-femur counts
- ★ Dose capsule = actual patient dose × 1mCi standard counts × decay factor

$$\text{Uptake \%} = \frac{(\text{Neck counts-femur counts})}{(1 \text{ mCi standard counts} \times \text{actual patient dose})} \times 100\%$$

Questions

1. Trouble shooting why the uptake ratio falsely lower or high
2. normal uptake range

Reference

1. Nuclear medicine The requisites in radiology

14 Line phantom SPECT image and analysis by Huang

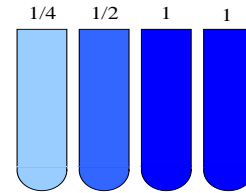
Aim: Using the Line phantom to compare the SPECT image Characteristic

Materials

- ⌚ Siemens ECAM Gamma camera
- ⌚ 5mCi $^{99m}\text{TcO}_4^-$
- ⌚ 1cc syringe \times 4

Procedure

1. Make the different times of concentration for the syringe
2. place the syringe in the parallel box
3. set the two different frame times of SPECT image
4. with the same reconstruction parameter to reconstruct the image
5. using the image J analysis software compare the line phantom transaction view
FWHM and ROI ratio



Questions

1. Answer the image analysis result