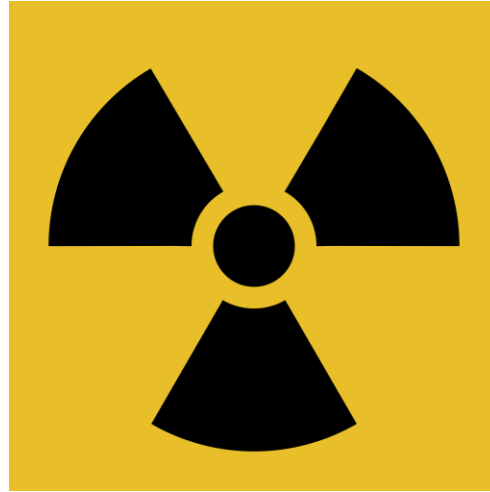


# KQ-“Is there like a nuclear bomb in my body?!”

Starter- Jot down everything you think you know about radiation



TIF- ‘Radiation is always harmful’  
Evaluate this statement



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# What is Nuclear Medicine?

## So... what is nuclear medicine?

structure. The use of these radioactive tracers is closely monitored. The techniques are very safe both for the patient and for the technologist.

### **What type of person is suited to a career as a Nuclear Medicine Technologist?**

- A wide variety of people would be suited to a career as a Nuclear Medicine Technologist. The most important factor is an ability to work and communicate well with people.
- While knowledge of science obviously plays an essential part, practical skills including patient care and interpersonal skills are equally important.

I have underlined some tricky phrases... What do you think these mean?

# Nuclear Medicine Technologist

## How do you train to become a nuclear medicine technologist?

There are two main routes to qualification as a Nuclear Medicine Technologist.

- You can choose a four year part-time BSc in Clinical Technology with specialisation in Nuclear Medicine during the degree. This is combined with training based upon formal practical experience in Nuclear Medicine.
- The other route is to take a BSc in Radiography, which takes three years, and then specialise in Nuclear Medicine, after first qualifying as a Radiographer. Practical experience can be obtained by working in a nuclear medicine department in hospital.

# So what does the job involve?

## **Nuclear medicine technologists typically do the following:**

- Explain imaging procedures to the patient and answer questions
- Follow safety procedures to protect themselves and the patient from unnecessary radiation exposure
- Examine machines to ensure that they are working properly
- Prepare radioactive drugs (radiopharmaceuticals) and administer them to the patient
- Monitor the patient to check for unusual reactions to the drugs
- Operate equipment that creates images of areas in the body, such as images of organs
- Keep detailed records of procedures
- Follow radiation disposal and safety procedures
- Remember there are dangers to radiation source !!!!!

***Think pair share: What skills might a NMT need?***

# Dealing with patient fears.

- One of the skills required is being able to deal with patient concerns in a sensitive manner.
- Watch the start of the following video and then discuss how Deepa handles the patient's concerns.
- <https://www.youtube.com/watch?v=-vDmlAN1B-g>

Can you give Deepa a few tips to help her calm the patient down?

# Devise a role play for a Nuclear Medicine Technologist and her patient

What is your PAFT?

## Rules

Work in pairs

Each take a role

Write a script

Ensure you clearly discuss the science, the benefits and risks, include language that is appropriate to your part

ANY QUESTIONS

KQ-“Is there like a nuclear bomb in my body?! 2”

**Radiopharmaceuticals STARTER- Read the information below and then rewrite it as best you can so a year 7 could understand it**

Radioactive drugs, known as radiopharmaceuticals, give off radiation, allowing special scanners to monitor tissue and organ functions.

Abnormal areas show higher-than-expected or lower-than-expected concentrations of radioactivity. Physicians and surgeons then interpret the images to help diagnose the patient's condition. For example, tumours can be seen in organs during a scan because of their concentration of the radioactive drugs.

*TIF- Are radioactive drugs safe? WHAT DO YOU THINK?*

# Uses of radiopharmaceuticals

- **Radiopharmaceuticals** can be used either for **diagnostic or therapeutic** (treatment) purposes. It is made up of a radioactive substance bonded to another **molecule**. This **molecule** carries the **radioactive substance** to specific organs, tissues or cells. The **radioactive substance** is selected according to the type of radioactive particle emitted.

*Use your common sense to suggest what characteristics the*

**diagnostic – short term, get in the body easily and out body easily**

**therapeutic – mid-term, stay in the body slightly longer**



# Diagnostic radiopharmaceuticals

- **Radioactive substances** emitting penetrating rays (called gamma rays) are used for **diagnostic (imaging)** where the radiation has to escape the body before being detected by a specific device (special **cameras**). Typically, the radiation emitted by the **Radioactive substances** used for imaging vanishes completely after **1 day** through radioactive decay and normal body excretion.

why is this important?

# Therapeutic radiopharmaceuticals

- **Radioactive substances** emitting **short range particles** (called **alpha or beta particles**) are used for therapy due to them losing their power over a very short distance, therefore causing a lot of **local damage** (such as cell destruction).
- This characteristic is used for **therapeutic purposes**: cancer cells destruction, pain treatment in palliative care for bone cancer or arthritis. Such **Radioactive substances** stay longer in the body than imaging ones; this is intentional in order to **increase treatment efficiency**, but this remains limited to several days.

# So back to Deepa..

- Nuclear Medicine Technologists need to be able to prepare and administer the radioactive tracers.
- But ....

# Which Radioactive substance would Deepa use for diagnosis and which one for treatment of the thyroid?

- Iodine 123 or Iodine 131?
- *I-131 - half life of 8 days*
- *I-123 - half life of 13 hours*

But first...

What does half life mean??

# Typical radiopharmaceuticals- Fill in the table

• Diagnostic

• Therapeutic

• Diagnostic	• Therapeutic