



SNS COLLEGE OF ALLIED HEALTH SCIENCES- COIMBATORE 35



DEPARTMENT : RADIOGRAPHY AND IMAGNG TECHNOLOGY

**SUBJECT : GENERAL PHYSICS, RADIATION PHYSICS AND PHYSICS OF
DIAGNOSTIC RADIOLOGY**

PAPER : PAPER II (UNIT 3 – RADIOACTIVITY)

TOPIC : 1. VARIOUS ISOTOPES USED IN MEDICINE



VARIOUS ISOTOPES USED IN MEDICINE

- The use of nuclear chemistry in medical technologies is increasing over time. The medical uses can be divided into two categories :
- (I) Medical imaging of organs or diagnosing any malfunction and
- (II) Therapeutic use, mainly for killing cancerous cells.
- Radioisotopes in medical imaging
- Criteria of radioisotope selection for medical imaging
- Those that emit γ -rays, directly or indirectly, during their decay, can be delivered to the organ of interest in pure form or tagged in a compound, are short-lived or can be excreted from the body after use.
- some radioisotopes commonly used in medical imaging. A low dose of the radioisotope is administered to a patient. The γ -rays cross over the body and are recorded like X-rays. A computer finally converts the recording into a useful image. The image is compared with an image of a healthy organ to diagnose any malfunction.



VARIOUS ISOTOPES USED IN MEDICINE



S.NO	RADIOISOTOPES	HALF LIFE	APPLICATIONS
1.	Cesium-131	9.7 Days	It emits photons, used in brachytherapy for malignant tumors.
2.	Cesium-137	30 Years	Used in medical devices (sterilization) and gauges.
3.	Chromium-51	28 Days	Used in diagnosis of gastrointestinal bleeding.
4.	Cobalt-60	5.26 Years	Used for controlling the cancerous growth of cells.
5.	Iodine-125	60 Days	Used in Brachytherapy to kill the cancer cells.



VARIOUS ISOTOPES USED IN MEDICINE



S.NO	RADIOISOTOPES	HALF LIFE	APPLICATIONS
6.	Iodine - 131	3 Days	Widely used in treatment for thyroid, thyroid diagnosis and renal blood flow.
7.	Iridium – 132	73.84 Days	Used as internal radiotherapy source for cancer treatment. It was the strong beta emitter for higher dose rate brachytherapy.
8.	Mo-99	67 hours	Used as the parent nuclei in a generator produced radioisotopes.
9.	Radium-223	11.4 Days	Used to treat prostate cancer that have spread to the bones.
10.	Rhenium -186	3.71 Days	Used for therapeutic purpose to relief pain in bone cancer.



INTERROGATIONS



1. What is Half life ?
2. What is Activity ?
3. What is specific activity of an atom ?



REFERENCES

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3. Basic Medical Radiation physics – Stanton.
4. Christensen's Physics of Diagnostic Radiology – Christensen.
5. The physics of Radiology and Imaging – K Thayalan.
6. Textbook of Radiological safety – K Thayalan.



THANK YOU