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How to teach radioactive decay and radioisotopes in an interdisciplinary, low-cost way

Activity 2: Worksheet A

Medical physics is a scientific field that involves using applications of physics in medicine. In this particular context, medical physicists need to understand principles such as the measurement of ionising (high-energy) radiation, ultrasound propagation, and the interaction of radiation with living matter. These specialists work in fields such as radiotherapy, where tumours are eradicated using ionizing radiation, or nuclear medicine, where the radiation emitted from radioactive materials is used to diagnose and treat diseases.

Every year, millions of medical diagnostic procedures are done using a radionuclide called **Technetium-99m (^{99m}Tc).**

Find more detailed information on Technetium-99m online.

1. What is the half-life of ^{99m}Tc? _____

2. Search for at least three more radionuclides that are widely used in medical physics. How does Technetium-99m's half-life compare to that of other radionuclides. Is it shorter or longer?

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3. Assess one advantage for the patient and one advantage for the medical physicist of using Technetium-99m for nuclear medicine purposes.

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4. Radiotherapy involves delivering sustained damage to a tumour using high energy radiation from short-lived isotopes. Would Technetium-99m be suitable for radiotherapy? Why or why not? Give two reasons for your choice.

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