17/MHS06/051

1. RADIOACTIVE TRACERS

Radioactive tracers are generally short-lived isotopes linked to chemical compounds which permit specific physiological processes to be scrutinised. They can be given by injection, inhalation, or orally.

Radioactive tracers utilize the positive qualities of radioactivity, the ability to emit a signal, while minimizing the negative effects.

The most common radioactive isotope used in radioactive tracers is technetium-99m, used in almost 30 million procedures in 2008, representing 80 percent of all nuclear medicine procedures, according to World Nuclear Association. It is an isotope of an artificial element, technetium, with a half-life of six hours, which provides enough time to perform the necessary diagnostic procedures, but provides patient safety. It is versatile and can be targeted to a specific organ or body part and emits gamma rays that provide the necessary information. Other radioactive tracers include iodine-131 for thyroid conditions, iron-59 iron to study metabolism in the spleen and potassium-42 for potassium in the blood.

2 APPLICATIONS OF TRACER IN MEDICINE

1. CT SCAN

2. Positron Emission Tomography(PET)

CT Scan

A major use of radioactive tracers involves computed X-ray tomography or CT scans. These scans constitute approximately 75 percent of medical procedures with tracers. The radioactive tracer produces gamma rays or single photons that a gamma camera detects. Emissions come from different angles and a computer uses them to produce an image. The treating physician orders a CT scan that targets a specific area of the body, like the neck or chest, or a specific organ, like the thyroid.