

## Nuclear reactions 6: Nuclear medicine

### Components

NAME	DESCRIPTION	AUDIENCE
	<i>Nuclear medicine</i> teachers guide	This guide shows how a video and comprehension worksheet may be used to elaborate on medical uses of radioisotopes. Safety procedures followed by handlers of radioactive materials are emphasised.
	<i>Too hot to handle!</i> <i>Working safely with radioisotopes</i> video	The video shows a technician preparing, dispensing and administering radioactive iodine to a patient.
	<i>Medical uses of radioisotopes</i> worksheet	This worksheet contains information about radiotherapy and related questions.

### Purpose

To **Elaborate** on uses of radioisotopes in medicine.

### Outcomes

Students:

- explain principles observed when handling radioactive materials;
- describe monitoring devices used by handlers of radioactive materials;
- understand possible dangers of handling radioactive materials;
- understand how radioisotopes can be used in diagnostic and therapeutic situations; and
- describe the process of brachytherapy.

### Activity summary

ACTIVITY	POSSIBLE STRATEGY
View the video, <i>Too hot to handle</i> .	whole class discussion
Students read and study text on worksheet, <i>Medical uses of radioisotopes</i> .	read
Students answer questions on the worksheet.	write responses

### Technical requirements

A modern browser (eg Internet Explorer 9 or later, Google Chrome, Safari 5.0+, Opera or Firefox) is required to view the video. A high quality MP4 version of the video is available by download from the SPICE website.

The guide and worksheet require Adobe Reader (version 5 or later), which is a free download from [www.adobe.com](http://www.adobe.com). The worksheet is also available in Microsoft Word format.

## Using the video

The video shows a physicist collecting, transporting and disposing of radioactive material. While doing so it is explained what safety protocols are in place to minimise exposure to radiation poisoning. The three main safety procedures (shielding, distance from source, and time exposed to source) are emphasised.

Discussion questions after viewing the video could include:

- What safety precautions are used by physicists when handling radioactive isotopes?

*gloves are worn*

*lead container is used to store the isotope when not in use*

*tongs are used to transfer the isotope*

*protective coat is worn*

*film badge (dosimeter) to detect radiation is worn*

*transfer is dispensed behind a lead wall*

*patient is seated in a separate room to where the isotope is dispensed*

*quantity (volume) of isotope is carefully measured*

- Would handling procedures for dealing with alpha emitters be different from handling gamma emitters?

*There would be no difference in protocols, despite alpha radiation being less penetrating than gamma radiation (this is a very conservative approach).*

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banner image: 'Transaxial slice of a human brain taken with positron emission tomography' by Jens Langner. PD. [en.wikipedia.org/wiki/File:PET-image.jpg](http://en.wikipedia.org/wiki/File:PET-image.jpg)

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## Associated SPICE resources