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Fact Sheet: Radiopharmaceuticals

Radioactive Drugs Manufactured in the United States

Radiopharmaceuticals

Radiopharmaceuticals are drugs that use radioactive material to treat or diagnose disease. These drugs can also be referred to as medical radioisotopes. Radiopharmaceuticals help to provide doctors with an image of a patient's internal organs through a noninvasive procedure. Less frequently, radioisotopes are used for treatment of cancer and other diseases, this is known as radiation therapy or radio immunotherapy.

Method of Administration

Approximately 85% of the medical radioisotopes manufactured in the U.S. are administered through intravenous injection. Other methods of administration such as oral inhalation and seed implant also exist. These processes leave a patient "hot" or radioactive. However, external beam radiation does not leave a patient radioactive afterwards.

Post-Procedure

After a nuclear procedure patients may remain radioactive for an extended amount of time. The period of time depends on the type of procedure and the isotope used. Typically a person remains radioactive for days to weeks. While a person is radioactive objects they use regularly like clothing and other fabrics can be contaminated with radioactivity. Most of the radioactive material is excreted through urine, feces, and sweat.

Dosages

The most frequent dosages of a radiopharmaceutical contains between 2 and 5 millicuries (mCi) and between 10-30 mCi. Only two drugs manufactured in the U.S. have recommended dosages exceeding 35 mCi : CardioGen-82 (made with 40-120 mCi of Rb-82) and Therasphere (made with 81-540 mCi of Y-90). If a drug is used for treatment, it typically has a higher dosage than if it is used to diagnose a disease.

Common Isotopes in U.S. Manufactured Drugs

Six isotopes combine for an estimated 75% of the medical radioisotopes encountered in the U.S. Even though isotopes are used for specific procedures, they are multipurpose drugs and can all be used for a variety of reasons.

The most commonly found isotopes used in U.S. radiopharmaceuticals are listed below.

Isotope	Uses
I-131	SPECT/CT imaging, treatment of thyroid cancer
F-18	PET/CT imaging, diagnosing Parkinson's disease
Tl-201	myocardial imaging, thyroid hyperactivity, ischemic heart disease
I-125	radiation therapy on prostate/brain
Tc-99m	imaging of heart, liver, spleen, brain, kidney, lung, cardiovascular system, skeletal system
Tl-202	myocardial perfusion scans, in conjunction with Tl-201

Other isotopes that may be found in U.S drugs may include:

- C-14
- Ga-67
- N-13
- Rb-82
- Y-90
- Co-57
- I-123
- P-32
- Sm-153
- Cr-51
- In-111
- Pd-103
- Sr-89

References

Most information in this report is drawn from Technical Reachback program data. Additional references include:

General Nuclear Medicine

<http://www.radiologyinfo.org/en/info.cfm?pg=genuclear>

What is Radiation Therapy

<http://www.cancer.net/navigating-cancer-care/how-cancer-treated/radiation-therapy/what-radiation-therapy>