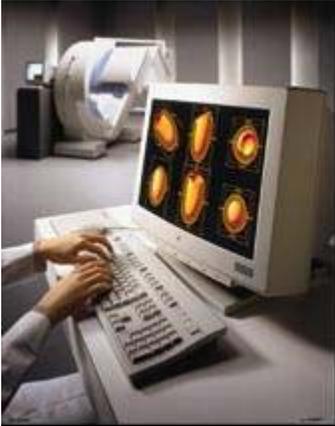


Nuclear Medicine

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Nuclear medicine as a diagnostic tool is becoming more commonplace in our society. There may come a time when you will experience the benefits of a nuclear medicine procedure. You need to inform your Radiation Safety Officer (RSO) if you have such a procedure, as it could affect your work at Fermilab.

What is nuclear medicine?

Nuclear medicine uses radioactive materials to provide diagnostic information on how your internal organs are functioning. It can also be used as a therapeutic treatment of specific medical conditions.

How does nuclear medicine work?

Nuclear medicine uses radioactive tracers or radioisotopes that are usually administered by injection. These radioisotopes emit radiation from within the body and can be seen on special cameras. Physicians view these “scans” to look for abnormal conditions.

What are some common tests that are used in nuclear medicine?

A variety of radioactive isotopes are used in nuclear medicine. The most commonly used radioisotope is Technetium-99m (Tc-99m). Tc-99m is used in 80% of all nuclear medicine procedures to image the skeleton, heart muscle, brain, lungs, liver, spleen, kidney, gall bladder and bone marrow, to name a few. Thallium-201 (Tl-201) chloride is used for heart perfusion imaging to diagnose coronary artery disease and other heart conditions. Chromium-51 (Cr-51) is used to label red blood cells. Gallium-67 (Ga-67) is used in tumor imaging for locating inflammatory infections. Xenon-133 (Xe-133) is used for lung ventilation studies. Iodine-131 is widely used in treating conditions of the thyroid such as hyperthyroidism and thyroid cancer. The radioactivity decays away after a short period of time dependent upon the radioisotope used.

Positron Emission Tomography (PET) is a more precise technique using isotopes that are produced in a cyclotron. Fluorine-18 (F-18) is a common radioisotope utilized in PET imaging for detection and diagnosis of various cancers.

If I plan to have a nuclear medicine procedure, whom should I notify?

You are not obligated to disclose this type of information, but you should contact the Medical Department or your RSO before or upon return to work after receiving a nuclear medicine procedure.

Your RSO and the ESH Section will work together to provide you assistance and advice regarding appropriate precautions that you should take based on your specific job function.

If you are a radiological worker, Article 962 of Fermilab's Radiological Control Manual outlines specific procedures that should be followed for an individual who receives a nuclear medicine procedure. Even if you are not a radiological worker, reporting these procedures can be very helpful to you and your co-workers.



How can a nuclear medicine procedure affect my work and co-workers here at Fermilab?

1. Your bodily fluids may end up in the regular trash bins at Fermilab. Even something as simple as blowing your nose and throwing out the Kleenex may expose your co-workers to the radioactivity in your system. If you've had a nuclear medicine procedure please take your trash, such as Kleenex and napkins home with you each day and dispose of these items at home. At Fermilab, trash is surveyed with a radiation detection instrument before it is picked up. If elevated radiation levels are found in a dumpster, it is locked down until the source of the radioactivity is removed. This process uses a lot of time and resources and can be avoided by taking personal trash home.
2. Radiation doses received from nuclear medicine procedures will affect the radiation exposure measured by your TLD badge. If you have a nuclear medicine procedure, you should not work in areas that require a TLD badge until the radiation from your body has decayed sufficiently so as not to affect your badge reading. Your RSO can help you determine this time frame. If you inadvertently wear your TLD badge, you should inform your RSO so that your TLD badge can be collected and an exposure investigation can be initiated.
3. Dose rates resulting from your nuclear medicine procedure may cause dose rates to nearby co-workers to exceed established Fermilab limits for office areas. Special radiological precautions will be employed until dose rates are below these limits.
4. The radioactivity in your body may interfere with the proper performance of radiation surveys. You may not enter any enclosure or other area that requires a personnel frisk to check for contamination until your dose rates are low enough to perform an effective frisk. Your RSO will determine when you are able to return to work as a radiological worker.

Nuclear medicine is a safe, painless, and cost-effective way of gathering information that may otherwise be unavailable or require more expensive and risky diagnostic tests. But let us know if you're having such a procedure so we can help you make your return to work is as smooth as it can be!

This message should be distributed to all employees via delivery of un-addressed copies to Fermilab mail stations. Suggestions for ES&H message topics should be directed to Mary Logue at grace@fnal.gov or X6329.