Intermountain® Healthcare

Radiation Exposure in Medical Tests

What is radiation?

Radiation is a form of energy used in common medical tests. It is used to provide clear images that help your doctor diagnose or treat a problem. Some common imaging procedures that use radiation are:

- X-rays
- Mammograms
- Bone density scans
- CT scans
- Angiograms
- Nuclear medicine exams

(Note: MRI and ultrasound tests do not use radiation.)

Images created using radiation provide important information about your health. They are often needed to help your doctor diagnose a problem or treat it in the best way. People are sometimes concerned or have questions about the radiation used in medical procedures. This handout will help you understand medical radiation and put it into perspective.

Understanding radiation

Radiation is a special form of energy that can pass through body tissues and show up on a camera to create images. Radiation use in medical testing can be measured in many different ways. The most useful way to measure radiation exposure in medical tests is using units called **millisieverts (mSv).**

We're all exposed to radiation 24 hours a day — from air, food, the ground, and even cosmic radiation from outer space. The amount of natural radiation increases with higher elevation. For example, during an airplane flight you receive more natural radiation than when you're on the ground. People living in Utah receive about 4 mSv of radiation every year from natural sources.

Many medical tests use radiation to create images.

These images can give your doctor important information about your health.

A medical test adds a small fraction of radiation exposure, when compared to these natural sources of radiation. For example, a chest x-ray exposes you to about the same amount of radiation as living in your natural surroundings for about 10 days.

Is there a risk from radiation?

It's well understood that exposure to high doses of radiation — much higher than the amounts used in medical tests — involves an increased risk of cancer, as well as other damage to the body. Most experts agree that there is also some risk connected to low-dose radiation exposure at the level used in medical tests. This risk is much lower.

In fact, for most medical tests, the added cancer risk is so small that it can't be measured on an individual basis. To put the risk in perspective, 42% of us will develop cancer in our lifetime, whether we have any medical tests or not.

Radiation risk and age

The risks posed by radiation depend on a person's age. The cancer risk from an imaging test is lower the older a person gets, and the highest risk is for children. Doctors take special care in choosing imaging tests for children, and Intermountain facilities adjust the radiation to fit each individual child. For more information on radiation for children, see the Image Gently site at **www.imagegently.org**.

How Intermountain works to increase your safety

Intermountain Healthcare takes extra steps to increase your safety with medical radiation. Here are some ways we help you get the benefits of medical imaging while minimizing the risks:

- We routinely review our processes and work hard to use the **least amount** of radiation necessary to produce diagnostic quality images.
- Our imaging teams are regularly trained in radiation safety, and we regularly inspect and maintain our imaging equipment.
- We participate in the **Image Wisely** and **Image Gently** campaigns. These campaigns involve a commitment to radiation safety and education. (See links to the Image Wisely and Image Gently websites at right.)
- Intermountain specialists communicate with doctors to help them choose imaging tests wisely. Intermountain specialists also consult with doctors about specific situations, if needed.

In 2012, Intermountain is adding another important step in its efforts to monitor and manage radiation exposure. Intermountain is one of the first healthcare systems in the country to track each patient's **cumulative (total) radiation exposure** from certain procedures that use higher amounts of radiation. (Because this doesn't include procedures at non-Intermountain facilities, it's also a good idea to keep your own record.)

Knowing your cumulative radiation exposure is helpful to your doctor. Your situation often dictates the medical procedure you need, and radiation is a key part of many procedures. Usually, the benefits from a procedure outweigh the slightly increased cancer risk from the amount of radiation used. However, your doctor may check your cumulative exposure as part of choosing which type of test is better for your medical needs. In some cases, a medical test that does not use radiation can be used as an alternative.

What you can do

If you are pregnant or might be pregnant, tell your doctor. Some procedures that use radiation are not appropriate in pregnancy, unless the medical need is severe.

Keep a history of all your procedures involving radiation and share this information with your doctor. At **www.radiologyinfo.org/en/safety/** you can find a printable imaging record.

Discuss planned procedures and alternatives with your doctor. Be sure to ask any questions you may have. Here are good questions to ask:

- What information will this procedure give you?
- How will this information improve my care?
- What's the risk of NOT having this procedure?

Where you can learn more

- To learn about **tests and treatments,** go to: **www.radiologyinfo.org**
- To learn about **radiation safety for adults,** go to: **www.imagewisely.org**
- To learn about **radiation safety for children,** go to: **www.imagegently.org**
- To learn about **radiation safety in pregnancy,** go to: **hps.org/publicinformation/ate/cat4.html**

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