



**Imaging Procedures
and Radiation Exposure**

Imaging procedures are used to take pictures of the interior parts of the body to help your health care team make a diagnosis.

Common imaging procedures we perform are:

- **CT (Computed Tomography) Scans**
- **Mammography**
- **MRI (Magnetic Resonance Imaging)**
- **Nuclear Medicine**
- **Ultrasounds**
- **X-rays**

Some imaging procedures use ionizing radiation, while others do not.

This brochure will explain more about exposure to ionizing radiation from imaging tests compared to naturally occurring background radiation.

To learn more, visit www.radiologyinfo.com or call Queen's Imaging to speak to a Radiation Safety Officer at 808-691-4771.

For more information, visit
www.radiologyinfo.com
www.queensmedicalcenter.com/imaging-services
 or call a Radiation Safety Officer at 808-691-4771



**Radiation Exposure from
Imaging Procedures**

CT (Computed Tomography) Scans
 Mammography • MRI (Magnetic Resonance Imaging)
 Nuclear Medicine • Ultrasounds • X-rays

Important Information for Patients



Medical Imaging Tests



What is ionizing radiation?

Ionizing radiation is electromagnetic energy, such as X-rays, or particles with enough energy to remove an electron from an atom or molecule.

How would I be exposed to ionizing radiation?

Radiation is naturally occurring in our environment. We are exposed to natural background radiation each day from the sun, food, water and air.

Some imaging tests use ionizing radiation. These tests include X-rays, CT (computed Tomography) scans and nuclear medicine studies.

Other imaging studies, such as ultrasounds and MRIs (Magnetic Resonance Imaging), do not use ionizing radiation.

How much radiation will be used in my X-ray or CT Scan?

The exact amount of radiation needed for an imaging test will vary depending on one's height, weight and the shape of the body.

Patients who are overweight or heavy-set, may require the use of more radiation in order for the X-rays to penetrate the body.

The radiation doses listed below are typical amounts expected for an average sized patient.

Queen's Imaging does its best to use the smallest amount of radiation that is needed to produce high quality images.

Is the radiation used for my test dangerous?

Low level radiation exposure, like the amounts typically used for common imaging procedures, has made a significant difference in the early diagnosis and treatment of serious health problems.

Exposure to low level radiation has not been definitively shown to cause an increased risk of cancer.

What has Queen's Imaging done recently about patient safety and radiation exposure from imaging?

We are committed to minimizing patient radiation exposure through regular equipment maintenance,

and periodic review and optimization of our scanning techniques. Our team includes a Radiation Safety Officer who monitors radiation levels to ensure the lowest possible exposure.

What can I do if I still have concerns about the use of radiation for my test?

The decision to order imaging procedures with ionizing radiation is made when a doctor or care team has deemed it is medically appropriate and the benefits outweigh any risk of harmful effects from radiation.

If you still have concerns, please talk to your doctor or care team.

TESTS:†	Radiation Exposure (Typical Effective Dose)	Comparable Amount of Natural Occuring Background Radiation	Number of Flights from NY to Seattle with Comparable Radiation Exposure	Percent of Annual Occupational Dose Limit*
CT Scan of the Abdomen and Pelvis	10 mSv	3.3 years	360	20%
CT Scan of the Head	2 mSv	240 days	72	4%
Chest X-Ray	0.1 mSv	12 days	3.6	0.2%
Mammography	0.4 mSv	7 weeks	14.4	0.8%
Ultrasound	No Radiation	0	0	0
MRI	No Radiation	0	0	0

† Adapted from <http://www.radiologyinfo.org> and Dauer Lt, AJR 2011; 196:756-761.

* Annual occupational dose limit for a radiation worker is 50 mSv/Year - U.S. Nuclear Regulatory Commission.