

## MEASURING RADIATION DOSE

The scientific unit of measurement for radiation dose, commonly referred to as "effective dose", is the millisievert (mSv). Because different tissues and organs have varying sensitivity to radiation exposure, the actual dose to different parts of the body from an x-ray procedure varies. The term "effective dose" is used when referring to the dose averaged over the entire body.

For This Procedure:	Your Effective Radiation Dose Is:	Comparable To Natural Background Radiation For:
<b>Chest</b>		
Routine X-ray	0.1 mSv	12.5 days
<b>CT Scan Chest</b>	<b>7 mSv</b>	<b>2.3 years</b>
<b>Abdominal and/or Pelvic Region</b>		
Barium Enema	2 mSv	8 months
Routine X-ray Pelvis or Chest	0.7 mSv	2.8 months
<b>CT Abdomen</b>	<b>4 mSv</b>	<b>16 months</b>
<b>CT Scan Abdomen and Pelvis</b>	<b>10 mSv</b>	<b>3.3 years</b>
<b>Central Nervous System</b>		
Routine X-ray Skull	0.1 mSv	12.5 days
<b>CT Scan Head</b>	<b>2 mSv</b>	<b>8 months</b>
<b>Whole Body CT Screening</b>	<b>10 mSv</b>	<b>3.3 years</b>

## Diagnostic Imaging Centre

St. Joseph's Hospital  
Room Co-200  
268 Grosvenor St.  
London, ON, N6A 4V2

Radiation Safety officer: 519 646-6100  
ext. 64155

### Helpful radiation safety links:

- The College of Medical Radiation Technologists of Ontario:  
[www.cmрто.org](http://www.cmрто.org)
- Ontario Ministry of Health and Long Term Care:  
[www.health.gov.on.ca/en/](http://www.health.gov.on.ca/en/)
- Radiological Society of North America Patient Safety:  
[www.rsna.org/Patients.aspx](http://www.rsna.org/Patients.aspx)

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Renowned for compassionate care, St. Joseph's is one of the best academic health care organizations in Canada dedicated to helping people live to their fullest by minimizing the effects of injury, disease and disability through excellence in care, teaching and research.

## Diagnostic\* CT (or CAT) Scan Patient X-ray Radiation Dose



\* Non Diagnostic CTs includes Scout CT, PET/CT, and SPECT/CT

## Diagnostic Imaging Centre St. Joseph's Hospital

[sjhc.london.on.ca](http://sjhc.london.on.ca)

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## WHAT ARE X-RAYS AND WHAT DO THEY DO?

X-rays are a form of radiant energy, like light or radio waves. Unlike light, x-rays can penetrate the body, which allows a radiologist or technologist to produce images of internal structures. The radiologist, out-patient clinic medical staff or medical radiation technologist can view these images on a computer.

## WHAT IS A CT SCAN?

Patients lying on a bed are slid inside a tunnel machine. As they slowly slide out of the tunnel, they are exposed to x-rays originating from a source that circles around the body area being assessed (e.g. head and/or spine and/or hip). A detector circling the tunnel registers the x-rays penetrating the body area being imaged.

Patients are scanned, or slid in and out of the tunnel. Images from first 1-3 scans, known as "Scout scans", are used to properly identify, locate, and position the body part being assessed. Scout scan images are not used to diagnose and involve greatly lower amounts of x-ray radiation compared to the next series of scans which are known as the 'CT scans'. Diagnostic CT scan images are used by physicians to diagnose. The amount of x-ray radiation involved in CT scans will depend on the body area being assessed

## WHAT IS A MEDICAL RADIATION TECHNOLOGIST?

A medical radiation technologist is a licensed medical professional that produces diagnostic images using various forms of radiation.

## ENSURING YOUR SAFETY

As with other medical procedures, x-rays are safe when used with care. Radiologists and medical radiation technologists have been trained to use the minimum amount of radiation necessary to obtain a diagnosis. The amount of radiation used in most examinations is very small and the benefits greatly outweigh the risk of harm. X-rays are produced only when the exposure switch is momentarily turned on. A specific sound/noise may be heard when the exposure switch is turned on. As with visible light, no radiation remains after the switch is turned off. Sound or noise heard before the switch is turned on and after the switch is turned off would be from equipment electronics that do not produce x-ray radiation.

## MINIMIZING YOUR RISKS

- If you have concerns about the amount of radiation you will receive from x-rays, discuss them with your doctor prior to your scheduled examination.
- For females between ages 10-55, if you are pregnant, think you may be, or have had blood drawn recently for a pregnancy test, tell your doctor. Please also inform the radiologist, out-patient clinic medical staff or the medical radiation technologist.
- If you must have a CT scan, tell your doctor or the technologist about any CT Scans you have had recently. You may not need to repeat them.

We are exposed to radiation from natural sources all the time. The average annual radiation effective dose (in mSv) that a person receives from naturally occurring radioactive material and cosmic radiation from outer space is 3 in Canada, 7 in Denver, 9.6 in South Dakota, and 12.5 in India.

## INQUIRING ABOUT YOUR X-RAY DOSE

Our radiation safety personnel (e.g. medical physicists, radiation protection/safety officer) will accept all patient inquiries concerning the amount of x-ray dose they received during a procedure.

Patient radiation dose calculation is based on many factors related to each specific x-ray procedure performed. Our reply to a request for the calculation of radiation dose received will take 1-2 days. The reply will also be forwarded to the patient's referring physician (i.e. family doctor ordering the x-ray procedure) who will then provide the x-ray dose information to the patient making the request.

Our calculation of radiation dose is only an approximation. At best it has an accuracy of +/- 10-20%

Radiation exposure from one CT scan from the head to the thighs is equivalent to the amount of radiation exposure Canadians experience from natural surroundings over 3.3 years.