

The radiation dose can be adjusted based on the type of exam and the type details of the image needed. The exposure settings can be adapted for children to deliver least amount of radiation for producing an image that shows the information to doctors needed.

A CT scan gives a small amount of radiation to the patient, and conventional radiography can give a hundred times less. Chest X-rays, for example, give about the same amount of radiation as we are exposed to just from several days' worth of naturally occurring radiation in our everyday environment.

| Pediatric exam | Equivalent period of exposure to natural radiation | Increase in the risk of cancer in the future |
|------------------------|--|--|
| Dental intra-oral exam | < 1 day | Extremely small |
| Chest X-ray | < 3 days | Chest X-ray |
| Head CT scan | ≈ 1 year | Minimal (very much less than 1%) |
| Abdominal CT scan | ≈ 1,5 year | Very low (much less than 1%) |
| PET CT | ≈ 6 years | Low (less than 1%) |

Positron emission tomography with CT

What questions might we ask?

You should feel confident that your referring physician or the imaging facility staff can provide information about your child's X-ray exams. Here are some examples of questions you may ask:

- Is the exam needed?
- Is the exam needed now?
- Do you know if this exam has been done recently?
- Can another exam be done which does not use ionizing radiation?
- Can an exam that has been already done give the information needed?
- How will the exam help with my child's care?
- What are the risks of this exam?
- What are the risks of not having this exam?
- How does the imaging facility assure that the right radiation dose is used according to my child's size?



X-RAY EXAM FOR CHILDREN

What do we need to know?

BENEFITS AND RISKS

On average, 1 in 3 people will develop cancer during their lifetime. X-ray exams may slightly increase this normal chance of developing cancer later in life. Children are especially vulnerable to the effects of radiation due to their growing tissues and their longer lifespan. When X-ray exams are needed for diagnosing an illness or injury in a child and they are performed with the proper technique, the benefits far outweigh the radiation risks.

How much do you know about radiation?

Radiation is energy that travels in the form of waves or particles. Radiation is part of our everyday environment. People are exposed to cosmic radiation from outer space, as well as to natural radioactive materials found in the soil, water, food, air and also in the body. The use of radiation in medicine is the largest artificial source of radiation exposure.

An important fact about radiation

There are two types of radiation: ionizing and non-ionizing radiation. Ionizing radiation can remove electrons from atoms (ionize). Medical and dental conventional radiography, computed tomography (CT), nuclear medicine and fluoroscopy are examples of exams that use ionizing radia-

tion. In contrast, non-ionizing radiation can make atoms vibrate, but does not have enough energy to remove electrons. Ultrasound and magnetic resonance imaging (MRI) are examples of exams that use non-ionizing

What exams use X-rays?

Medical and dental conventional radiography Radiography is the use of X-rays to visualize the internal organ and structures of the body including filmbased techniques as well as digital. *Figure 1*

Computed Tomography (CT)

A computed tomography or CT scan is an exam that uses X-rays to get images of the body, showing detail of organs which is not available on conventional radiographs. *Figure 2.*

Fluoroscopy

Fluoroscopy is like a video which uses x-ray pulses to show organ motion within the body in real-time, and allows performing procedures involving small devices (e.g. catheters, needles, balloons). *Figure 3.*

What is the value of medical imaging in children?

Radiology is an essential part of pediatric health care. X-ray imaging exams can save lives and X-ray guided interventions may replace more invasive surgery. The benefit

of an X-ray exam should always outweigh the radiation risks. It is not certain that there is any risk at very low doses, and if there is, it is very small. Even so, your radiology team takes radiation protection in pediatric imaging seriously and uses the smallest amount of radiation necessary.

Figure 4



Fig 1



Fig 2



Fig 3



Fig 4

// We should be sure that an imaging exam will do more good than harm (doctors call this "justification"). It is important to deliver the smallest amount of radiation needed to obtain images for the desired purpose (doctors call this "optimization"). Both are part of responsible and ethical medical practice. //

Contact Us

P.o.Box:7289 Kigali-Rwanda
Kigali - Rwanda
Toll free: 3988
Email: info@rura.rw
www.rura.rw