



What Parents Should Know About CT Scans for Children: Medical Radiation Safety

What Is an X-ray?

X-rays are invisible beams of ionizing radiation that pass through the body and are altered by different tissues to create 2-dimensional images of many organs.

What Is a CT scan?

CT scans use x-rays generated from a source that is rotated around the body to create 3-dimensional pictures of the body. CT studies can provide critical information for the care of your child, but obtaining the images results in more radiation exposure for the study than a single X-ray.

How much radiation is used in these exams?

We all are exposed to small amounts of radiation daily from soil, rocks, building materials, air, water, and cosmic radiation. This is called naturally occurring background radiation. The radiation used in X-rays and CT scans has been compared to background radiation we are exposed to daily. This comparison may be helpful in understanding relative radiation doses to the patient.

Radiation source

Days background radiation

Background.....	1 day
Chest X-ray (single).....	1 day
Head CT.....	up to 8 months
Abdominal CT.....	up to 20 months



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Image Gently is the educational and awareness campaign created by the Alliance for Radiation Safety in Pediatric Imaging that was formed in July 2007. It is a coalition of health care organizations dedicated to providing safe, high quality pediatric imaging nationwide. The Society for Pediatric Radiology as well as over 33 other societies are members of this coalition representing more than 500,000 health care professionals in radiology, pediatrics, medical physics, and radiation safety.

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What are the risks from medical radiation?

There is no conclusive evidence that radiation from diagnostic X-rays causes cancer. However, some studies of large populations exposed to radiation have demonstrated slight increases in cancer risk even at low levels of radiation exposure, particularly in children. To be safe, we should act as if low doses of radiation may cause harm.

The risk for radiation induced cancers should be evaluated against the statistical risk of developing cancer in the entire population. The overall risk of a cancer death over a person's lifetime is estimated to be 20-25%. For every 1,000 children, 200-250 will eventually die of cancer if never exposed to medical radiation. The estimated increased risk of cancer over a person's lifetime from a single CT scan is controversial but has been estimated to be a fraction of this risk (0.03- 0.05%). These estimates for the population as a whole do not represent a direct risk to one child. This information shows that the risk of developing cancer related to a single CT scan is very small, but the available research indicates that there may be some risk and the risk may be cumulative.

How can we minimize radiation risk to my child?

There are ways to ensure that your child is exposed to the smallest amount of radiation possible during an imaging study. The Image Gently Campaign is promoting optimal scanning strategies for children and they are listed below:

- Image when there is a clear medical benefit
- Use the lowest amount of radiation for adequate imaging based on size of the child
- Image only the indicated area
- Avoid multiple scans
- Use alternative diagnostic studies (such as ultrasound or MRI) when possible

If I still have concerns regarding radiation exposure to my child, whom should I talk to?

You should first talk to the physician who is requesting your child's exam. Your doctor and the radiologist can work together on decisions about which study is best to perform. If you still have questions, ask to speak to the radiology physician.

The information contained in this publication should not be used as a substitute for the medical care and advice of your pediatrician. There may be variations in treatment that your pediatrician may recommend based on individual facts and circumstances.