

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



SAFE SCANNING FOR KIDS AT KAPI'OLANI

Kapi'olani Children's Hospital specializes in diagnostic imaging for newborns, children and teens. That means everything from our equipment to our pediatric protocols, are tailor made for kids. At Kapi'olani, we use the lowest radiation level of any CT scanner in the state. In fact, our levels are far below the American College of Radiology (ACR) recommendations.

5 YEAR OLD, SCAN OF ABDOMEN

ACR Recommended Dose: 20.0 mGy

Kapi'olani Dose: 6.0 mGy

70% lower

5 YEAR OLD, SCAN OF HEAD

NRPB Recommended Dose: 43.0 mGy

Kapi'olani Dose: 35.5 mGy

17% lower

** the lower the number the smaller the radiation dose*

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 back-ground radiation. The radiation used in X-rays and CT scans has been compared to background radiation we are exposed to daily.

Parents can find comfort in knowing that Kapi'olani has the lowest CT radiation levels in the state, and is well below the recommended levels for children.

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 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 (imagegently.org) created by the Alliance for Radiation Safety in Pediatric Imaging is promoting the following optimal scanning strategies for children which Kapi'olani adheres to:

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

For added safety, Kapi'olani utilizes additional shielding to protect the patient's eyes, thyroid, and sternum.

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.

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KAPI'OLANI
MEDICAL CENTER
FOR WOMEN & CHILDREN
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Preparing For Your Child's CT Scan

What do I need to do to prepare my child for the scan?

The preparation for a CT scan is minimal. Your child simply needs to wear comfortable, metal free clothing. If your child is to receive contrast, he/she must not eat for four to six hours prior to the scan. If your child requires sedation, typically for children age 4 and under, he/she must not eat for six hours prior to the sedation.

What if my child requires sedation?

Sedation is typically used for children age 4 and under, so they remain still during the exam. If your pediatrician orders sedation, our doctor and/or nurse will administer the sedation and stay with your child during the scan. Children requiring sedation must not eat for six hours prior to the scan. One advantage of Kapi'olani's multi-slice CT is the ability to scan at high speeds that reduce the need for sedation.

What if my child requires contrast with his/her CT scan?

The use of contrast makes it possible to view a particular organ, body tissue, or blood vessel more clearly and in better detail. Your child may receive contrast by mouth, by rectum, and/or by injection.

- **Oral Contrast.** A child must not eat for a minimum of four hours prior to drinking the contrast.
- **Contrast by Injection.** This method of administering contrast will feel similar to when your child receives an injection in the doctor's office.

Our technologist will need to know what allergies your child has and if your child has any kidney problems. You will be asked if your child has any food or drug allergies, especially seafood (crab, shrimp, lobster, clams, etc). Both the contrast and seafood contain iodine. If your child is allergic to seafood, he/she may be allergic to the contrast. Patients can be pre-medicated against allergic reactions if their medical history indicates a need. The I. V. contrast used at Kapi'olani is non-ionic with a very low risk of allergic reaction. When I. V. contrast is used, some patients say they feel a warm sensation or a metallic taste in their mouth.

Occasionally a patient experiences itching and hives. Light-headedness or difficulty breathing may indicate a more severe reaction. However, reactions to contrast are rare and our staff is with your child to identify and manage any problem promptly.

What happens during the scan?

- A CT scan can last as little as two seconds to several minutes. Your child will lay down on the table in a comfortable position. Foam padding and soft velcro restraints are used for both child safety and to help your child remain still. Children should be encouraged to tell the technologist if they are uncomfortable.
- Your child will hear some clicking, buzzing, and whirring sounds from the scanner. During the scan, your child only needs to lie still and hold his/her breath, if possible. The best exams are obtained if the child is able to hold his/her breath. Younger children are often not able to do this adequately to prevent motion. Kapi'olani's multi-slice scanner helps to compensate as it can scan large sections of the body very quickly.
- Once your child and the table are correctly positioned, our CT technologist will leave the room to conduct the exam from the control console.
- You will be allowed to stay in the scanner room with your child unless you are pregnant. You will wear a lead apron for your protection. Our CT technologist sits at a console behind a window only a few feet away from your child.
- After the CT exam is completed, you will be asked to wait a few minutes while the exam is checked by one of our radiologists. If necessary, additional scans can be completed before you leave.

