What You Should Know

About Pediatric Nuclear Medicine and Radiation Safety

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What is nuclear medicine?

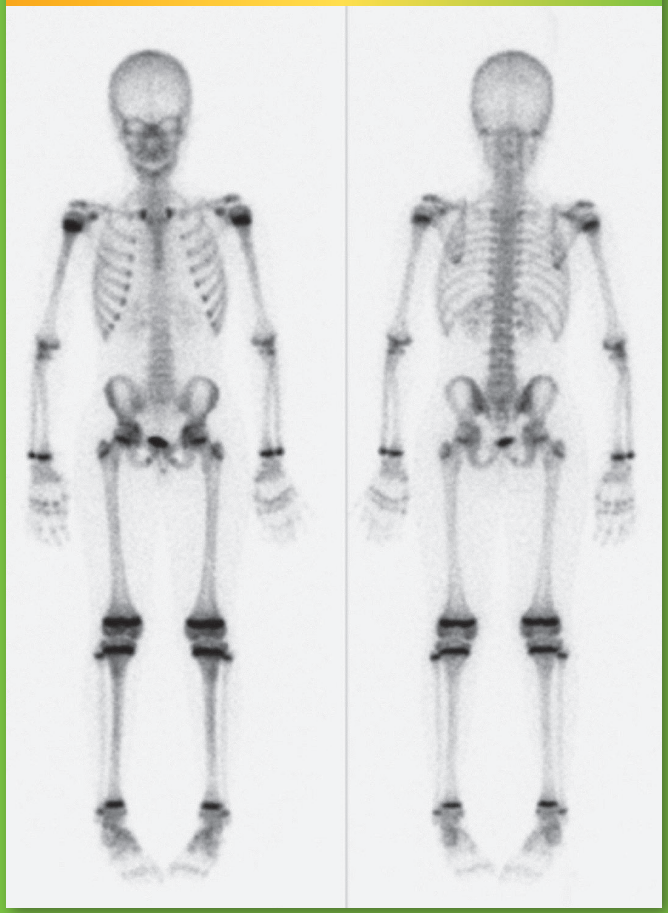
Nuclear medicine uses radioactive isotopes to create pictures of the human body. These pictures help doctors find health problems and plan treatment. Nuclear medicine tests can find infections, birth defects, injuries and tumors. These tests often give doctors new information. Most imaging tests only show a picture of the body part. Nuclear medicine is a different kind of test. It shows doctors how well the organs are working.

How are nuclear medicine studies done?

Patients are given a very small amount of a radiotracer or radioisotope. These radiotracers travel to the part of the body of doctors want to see. Radiotracers are most often given through a vein using a small needle. The insertion of the needle may hurt for a short time. This can be made easier with the help of supportive staff and parents. Depending on the test, radiotracers may be given in a drink or food or placed into the bladder or stomach through a small tube. For other tests, it can be breathed in using a mask. The radiotracer gives off invisible rays called gamma rays. These rays can be seen by special cameras. This big camera does not touch the patient and does not produce any radiation. These cameras create pictures of the radiotracer in the body. These pictures help doctors see the bones, heart, brain, liver, bladder or kidneys. The pictures show the doctor how well these body parts are working. For example, a radiotracer that shows if the bones are healthy produces a “bone scan” like the one in the picture on the right.

For some tests, patients are given the radiotracer and pictures are taken right away. With other tests, the child needs to wait while the radiotracer travels to the body part the doctor wants to see. Time for the test depends on the type of study. It may take from 2 minutes to several hours or, rarely, days. In some tests it may be necessary to take pictures at different times. It is important for the child to lie still while the pictures are taken.

Bone scan



How much radiation is in a nuclear medicine test?

Your child will be exposed to a very small amount of radiation. Often the dose is within the lower range of x-rays, such as a chest x-ray. As these tests show how the organs are working and are often lower in dose, nuclear medicine tests are one of the safer and effective diagnostic tests used in children. The radiation from a nuclear medicine test comes from the radiotracer. The amount of radiation exposure depends on the type of study.

Nuclear medicine doctors want to make sure your child receives the smallest radiation dose needed to get the best information. The dose of radiotracer is determined by your child's weight, the reason for the test and the body part being tested. The radiotracers change quickly into non-radioactive forms. Some of the radiotracer leaves the body in urine or stool. Drinking plenty of fluids can help some radiotracers leave the body faster.

Some parents wonder about radiation coming from their child after a radiotracer is given. In most cases, this amount is small. It is usually less than 2% of the radiation we get each year from nature. This amount of radiation can be similar to the radiation you get flying from Boston to Los Angeles. In most cases, the parent can stay with their child during the test.

How can we reduce radiation risk to my child?

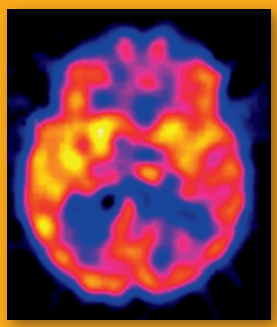
We are all exposed to radiation in our life from the earth, buildings and space. This is called background radiation. People living in the mountains or flying in planes are exposed to higher background radiation than those living near sea level. The amount of radiation used during a nuclear medicine test is small. However, it is still important to keep radiation exposure as low as possible. Nuclear medicine doctors want your child exposed to the smallest amount of radiation possible during their test. The Image Gentlysm campaign and the Pediatric Imaging Council of the Society of Nuclear Medicine are committed to delivering the lowest radiation dose while making sure the pictures are good.

Doctors balance the benefit and potential risks of imaging tests. Your doctor and the nuclear medicine physician will work together to decide which test is best for your child. Different tests are done based on facts of your child's illness.

Here are some examples of other nuclear medicine scans.

Kidney scan

Brain scan



The Image Gently Campaign is the educational campaign created by the Alliance for Radiation Safety in Pediatric Imaging. It is a group of health care organizations that want to promote safe, high quality pediatric imaging throughout the world. The Society for Pediatric Radiology and the Pediatric Imaging Council of the Society of Nuclear Medicine, as well as over 50 other societies, are members of this group. We are a group of over 700,000 health care professionals in radiology, pediatrics, medical physics and radiation protection. More information can be found at www.imagegently.org.

This pamphlet is written to provide patients, parents and caregivers with information about nuclear medicine and radiation exposure. We hope this pamphlet answers your questions. We hope it helps you understand your child's care. The information contained in this booklet should not be used as a substitute for the advice from your doctor. If you are concerned or have any unanswered questions, you should talk with a nuclear medicine professional before the study begins. You should ask questions to help you understand the test being performed.

References

www.imagegently.org
www.radiologyinfo.org
www.rpop.iaea.org
www.snm.org