Decreasing Unnecessary Radiation Exposure for Children

Today there are several methods of medical diagnostic imaging. These include radiography (sometimes called x-rays), computed tomography (sometimes called CT scans), fluoroscopy, and nuclear medicine scans.

- In radiography, x-rays (invisible beams of ionizing radiation) pass through the body and create 2-dimensional images of many organs and bones. Radiography may be used to evaluate for a possible broken bone or pneumonia.
- In computed tomography, x-rays are rotated around the body to create 3-dimensional pictures of the body. Computed tomographic scans lead to increased exposure to ionizing radiation compared with a single radiograph. Computed tomography may be used to evaluate a head injury or possible appendicitis.
- In fluoroscopy, a contrast liquid is given to the patient to fill an organ so that it is easier to see on x-ray pictures. Fluoroscopy may be used to evaluate how well the stomach or intestine is working.
- In nuclear medicine scans, the patient is given a radiotracer or radioisotope. These radiotracers give off gamma rays that can be seen by special cameras and show how well particular body parts are working, such as bones, heart, brain, or kidneys.

These diagnostic imaging tools can be very helpful to physicians in making a diagnosis. Although these tools can be very useful in some situations, it is recommended that they are not used routinely or in situations in which the diagnosis is already clear. A major risk of these medical diagnostic imaging procedures is that they lead to low-dose ionizing radiation exposure. The main concern for this radiation exposure is the risk for future cancer. Children and infants are at higher risk of this compared with adults because children's tissues are still developing and are thus more sensitive to radiation and because children have a longer life span, which may allow additional time for negative health effects to happen.

A study in this month's issue of the Archives looked at rates of radiation exposure among infants and children. It found that between 39% and 44% of children younger than 18 years had experienced at least 1 diagnostic imaging procedure that used radiation. There were higher rates among children aged 10 years and older and among boys. The most common diagnostic imaging procedures were radiography and computed tomography. Based on this study, the average child in the study population will have received more than 7 procedures by the time he or she reaches age 18 years. This is concerning because repeated exposure to radiation increases the possibility for health problems.

It is important to know that appropriate use of these medical imaging procedures balances the risks from radiation and the necessity of making a medical diagnosis.

Recommendations for physicians and parents include the following:
- Use imaging procedures only when there is a clear medical benefit.
- Hospitals and radiologists should use the lowest amount of radiation for appropriate imaging based on the size of the child.
- Only the area of the body that is of concern should be imaged.
- Try to limit multiple imaging procedures in the same child.
- When possible, use diagnostic studies that do not involve radiation, such as ultrasonography or magnetic resonance imaging.

For More Information

Image Gently program, Alliance for Radiation Safety in Pediatric Imaging
http://www.pedrad.org/associations/5364/ig/

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Source: Alliance for Radiation Safety in Pediatric Imaging

Megan A. Moreno, MD, MEd, MPH, Writer
Fred Furtner, Illustrator
Frederick P. Rivara, MD, MPH, Editor

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