

Misunderstanding about radiation risks from medical imaging abounds

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“Will it hurt?”

This is a familiar, almost a signature phrase heard by pediatric health care providers. The medical community has been well-positioned to address this question in a variety of scenarios and styles with patients, parents and other caregivers.

But what about when parents are told their child needs a CT scan and they ask: “Will it hurt? I mean even years later ... Could it hurt? I heard....”

This is a little tougher.

The issue is ionizing radiation, which is requisite for X-rays and examinations that use X-ray technology such as fluoroscopy and CT examinations. Nuclear medicine studies also depend on ionizing radiation to form images. The benefits of such studies are recognized, and they can be life-saving. But what are the risks?

The word *radiation* evokes fear for many. Radiation can cause cancer in high doses, levels much higher than those used for routine X-rays or a single CT scan, one of the higher-dose medical imaging examinations.

Misunderstanding about radiation and medical imaging abounds among both the public and health care providers.

For example, a systematic literature review was done on the topics of radiation dose and radiation-induced cancer awareness, informed consent regarding radiation dose, and communication of radiation-induced cancer risks with patients undergoing medical imaging (Lam DL, et al. *AJR Am J Roentgenol*. 2015;205:962-970). Results showed that 8%-28% of physicians surveyed, including pediatricians and radiologists, mistakenly believed that MRI used ionizing radiation. Up to 15% of the groups surveyed thought the same for ultrasound.



There are reports linking childhood CT examinations to cancer. One frequently cited, although contested, investigation concluded that there was an approximate risk of one additional brain tumor per 10,000 childhood brain CT examinations (Pearce MS, et al. *Lancet*. 2012;380:499-505).

Some agree there is risk at low doses such as those used in medical imaging. Many medical and scientific organizations, however, say the risk is uncertain, if there is a risk at all.

In April, the World Health Organization released the free publication “Communicating Radiation Risk in Paediatric Imaging” (<http://bit.ly/2bJEYBL>), which addresses issues related to radiation doses, radiation risk and communication strategies.

In addition, the Image Gently Alliance (see Resource) was started in 2007 to educate and raise awareness regarding the use of medical imaging using ionizing radiation in kids. The alliance now includes more than 100 societies and organizations (over one-third are international) representing more than 1 million health care professionals. The Academy has been an alliance member from the beginning.

Information from the Alliance stresses informed use and underscores the benefit of medical imaging. Content includes information for parents and health care providers with translations into over 20 languages.

Messaging has consisted of six campaigns: CT, interventional radiology, fluoroscopy, computed radiography (standard X-ray technology), nuclear imaging and imaging use in dental practice.

This fall, the Alliance will launch its “Think A-Head” campaign, which targets minor head trauma in children. The campaign emphasizes when CT is appropriate and techniques to optimize CT performance in this patient population. The Academy is among numerous partner organizations in this campaign, which includes membership by radiologists, technologists, nurses, medical physicists, pediatric trauma surgeons, pediatric neurosurgeons and emergency medicine physicians.

With this campaign as well as the other national and international resources available, the question of CT and radiation risk and ensuing conversation should “no longer hurt.”

Dr. Frush is a member of the AAP Section on Radiology. Dr. Mercado-Deane is chair of the section’s executive committee.

Resource

- [Image Gently Alliance](#)

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