

## Children and Medical Radiation



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Medical imaging is frequently necessary and is essential in diagnosis and management of children with illness and injury. Much of medical imaging requires ionising radiation. A discussion of radiation exposure is especially relevant in children due to their increased vulnerability, including to radiation-induced cancer, according to a report published in the journal *Environmental Research*.

**See Also:** [Balancing Radiation Doses](#)

"Perspectives vary regarding cancer risk and levels of radiation resulting from diagnostic imaging, however most medical and scientific organisations support the perspective that the risk of cancer at these levels is uncertain," says the report authored by Donald P. Frush, MD, FACR (Duke University Medical Center) and Maria Del Rosario Perez, MD (Department of Public Health and Environment, WHO).

Despite that virtually all diagnostic imaging radiation is considered low-dose level, there is still a broad misperception about what modalities use ionising radiation and how much radiation risk exists in the medical environment, the authors note.

Children are in general more vulnerable to ionising radiation primarily due to their growing tissues. About 25 percent of cancer types have increased radiation susceptibility in childhood (e.g., leukaemia, thyroid, skin, breast and brain cancer), while about 15 percent are equal in childhood and adult (e.g., colon cancer). It should be noted, however, that all cancers are not radiation sensitive. For example, melanoma and Hodgkin lymphoma are such types of cancer.

Doses for paediatric examinations can vary. For example, CT evaluation of the kidney for a tumour would require a higher dose, due to the often helpful multiphase (more than one pass through the kidneys in different phases of intravenous contrast media enhancement) examinations than a CT that is generally non contrast and relatively low dose for assessment of well seen dense (e.g., calcified) kidney stones. Establishing the "right dose" on a large scale is ongoing and is the concept of diagnostic reference levels (DRLs) which are determined from aggregate data for radiation dose metrics for typical examinations, such as a chest x-ray, or brain CT exam for groups of standard-sized or -aged patients.

While radiation has not been typically a topic of discussion in the professional circles addressing environmental health issues until relatively recently, radiation exposure from medical imaging has been a significant issue in Radiology for more than a decade and is the source of concern in the public as well as individual patients and care providers, the authors point out.

They add, "Much of what is available in the public media about radiation use in medical imaging is not balanced and promotes perspectives of harm. The importance of the role of the imaging team for informed conversations about radiation use and potential risks cannot be overstated."

It is important to have balanced and informed resources for the use of ionising radiation in the care of children, the report says, adding that resources such as the WHO publication on communication of radiation risks and benefits in paediatric imaging are valuable tools.

Source: [Environmental Research](#)

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