

Safer CT scanning for children developed

April 4 2011

A research team at the Queen Silvia Children's Hospital has developed a method that allows the lowest possible dose of radiation for children having a CT scan while still obtaining good image quality, reveals a thesis from the Sahlgrenska Academy.

Computed tomography (CT) is an advanced form of X-ray examination which generates images that are extremely detailed and very useful in diagnosing patients. If the dose of radiation is lowered too far, however, the scans become blurred and there is a risk of missing small details.

The author of the thesis, medical physicist Kerstin Ledenius from the Department of Radiophysics at the Sahlgrenska Academy, has studied and tested a new method together with radiologists, nurses and medical physicists at the Queen Silvia Children's Hospital. This method manages to combine the lowest possible dose of radiation with what radiologists consider to be sufficiently high image quality for correct diagnosis. In various studies, the research group also looked at the image quality of CT scans of the brains and stomachs of children in various age groups from birth to 17 years.

Computer manipulation of images from previous scans was used to simulate various reductions in radiation dose. The research group then assessed the results of the simulation and decided whether exposure to radiation should be adjusted for the next patient in the same situation, and if so by how much. This made it possible to find the lowest exposure capable of producing a sufficiently good image for each type of examination performed.

"Adjusting exposure is important, as a small patient does not need the same exposure as a large one," explains Ledenius. "Children also differ anatomically from adults, which affects the image quality needed."

The method is already in use at the Queen Silvia Children's Hospital, and Ledenius hopes that more hospitals will follow suit.

"Our method ensures the best possible [CT scanning](#), combining images of high quality with the least possible exposure to radiation."

Computed tomography (CT) is a medical imaging method where multiple 2D images are combined with the help of a computer to reveal the structure of tissues in a section of the body in 3D. This is achieved by passing X-rays through the body from different angles. CT scans are used primarily to diagnose diseases inside the skull and spine. In 2005, a total of 5.4 million X-ray examinations were performed in Sweden, with CT scans accounting for 12% of these and around 60% of the total dose of radiation. Three years later, in 2008, CT scans accounted for 72% of the total [radiation dose](#), the number of scans having increased by 36%, but some doses having been lowered. The reason for the increase in exposure is that more CT scans are being performed, because they enable more reliable diagnoses than standard X-ray examinations.

Provided by University of Gothenburg

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