On Balancing the Benefits and Risks of CT Radiation Exposure

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Over the past 25 years, computed tomography (CT) scans have become one of the most powerful tools in medicine. Recent news, however, has highlighted potential health risks from radiation exposure associated with CT. One study projected a sizeable number of new cancers that could arise from all CT studies performed in the U.S. in 2007. Another found a wide variation in radiation doses for common CT exams. Also in the headlines: alarming instances of high radiation overexposure from CT scans.

Yes, our medical community should be concerned. While we have recognized the potential risks of CT exams for years, the new numbers reflect a remarkable increased use of this extremely valuable diagnostic tool. By some estimates, 72 million CT scans were performed in 2007 in the US.

Let’s remember two key points. Statistically, an individual's presumed increased risk of cancer from one CT, or even a handful, is very low. And, while overuse and overexposure are always concerns, this data must be weighed against what may happen to a patient if he or she does not have a CT scan. Is the population at large better off or worse off? We don’t yet have an answer.

Our challenge, then, is to use CT most appropriately while minimizing the risk it imposes. At Wake Radiology, we approach this on a variety of fronts.

Wake Radiology employs stringent dose reduction guidelines for adult and pediatric CT exams; our protocols have been well below recommended levels for some time. It is critical that children not receive adult doses, and Wake Radiology participates in the Image Gently® initiative sponsored by the Alliance for Radiation Safety in Pediatric Imaging.

We also are proactive in suggesting alternative modalities to avoid radiation altogether. The number of indications for which MRI and ultrasound may be used continues to grow, including most diseases of the abdominal organ systems.

Thus, we put great stock in helping clinicians select the most appropriate imaging to minimize exposure, and each Wake Radiology subspecialty section maintains a consultation hotline for this purpose. Our annual Radiology Today seminar, open to all physicians, introduce state-of-the-art imaging and provide guidance on appropriate ordering. Our web site carries a link to the American College of Radiology’s most current ACR Appropriateness Criteria.

Experience and expertise are vital to minimizing exposure. All Wake Radiology outpatient locations have a radiologist on site, and 100 percent of technologists are CT certified by the American Registry for Radiologic Technologists. This caliber of care provides a multitude of benefits. One example is the work-up of a patient found to have an incidental mass on a chest x-ray. With a radiologist on site, the CT technologist can ask him or her to define the area to be scanned. If the suspect nodule is in the upper part of the lung, a scan of a third or a half of the lung often will allow a diagnosis.

In addition to the above, we reduce exposure to breast and thyroid tissue by using bismuth shielding. Our CT scanners utilize dose modulation, a feature that dynamically measures body density during the scan and decreases the dose depending on the density of bone it must penetrate. We also record the dose of each scan in the patient’s permanent chart.

Behind the scenes, part of my mission is to organize and maintain safety protocols and oversee the rigorous American College of Radiology CT scanner certification program. All scanners in our outpatient offices are certified or have certification underway, as is the case for our two newest scanners. We very closely and continuously monitor settings and output.

Overall, we believe it’s reasonable to conclude that the radiation patients receive from CT scans does pose a small but real risk, one that will slightly increase with each additional scan. With care taken at every level, this risk can be minimized. That being said, CT remains one of our most essential diagnostic tools to evaluate and follow a great number of medical conditions.

References: