Worried About Getting a CT Scan? Here's What to Ask Your Doctor

An interview with UCSF's Andrew H. Ko, MD, about the benefits and cancer risks of CT scans.

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Medical imaging scans that create detailed images of the body's internal structures are widely used in medicine. Doctors need them to detect and manage certain types of cancer, assess the extent of traumatic injuries, and diagnose and treat many other medical conditions.

But the scans, known as computerized tomography (CT) scans, use x-rays that expose patients to cancer-causing radiation. And there is concern that a diagnostic tool that has become deeply embedded in American medicine is sometimes overused.

A recent study predicted that up to 5% of all cancers would be caused by CT scans, raising questions about when and how the technology should be used. The greatest risk is to infants, since they are growing rapidly and will live for the longest time after the exposure.

Low-dose CT scannerCourtesy of American Lung Association

Andrew H. Ko, MD, a University of California, San Francisco (UCSF) professor of clinical medicine and associate chief of the Division of Hematology/Oncology, says CT scans are often the best tool a physician has to evaluate a patient's symptoms, and the risk of getting them is very modest overall. But patients should feel comfortable asking their doctors if a CT scan is absolutely needed and whether another technology that does not use radiation could be used instead.

Below is an interview with Ko.

Are CT scans dangerous?

The take-home message should not be that CT scans represent a major danger and therefore need to be avoided at all costs. CT scans represent an important diagnostic tool for many conditions. In my field of medical oncology, for example, we rely on CT imaging for the diagnosis, management, and surveillance of patients with cancer.

It's also important to recognize that CT scans use ionizing radiation to create images, and ionizing radiation — especially if the scan uses a high dose of radiation or a patient gets repeated scans — can result in DNA damage, creating mutations. This has been modeled to increase a person's lifetime risk of cancer to a modest degree. Therefore, it makes sense to consider when CT scans are really necessary, and when they might not be.

How should patients discuss CT with their doctor?

Patients should not hesitate to engage with their health care provider and discuss whether a CT scan is needed, what they expect to find or are trying to rule out by performing a CT scan, and whether any alternative means for diagnosing the problem might be equally reasonable — at least as the immediate next step before ordering a CT scan.

Should patients ask if alternative options like ultrasound or MRI are more appropriate?

In select situations, other imaging approaches may represent viable alternatives to a CT scan. Ultrasound and MRI, unlike CT scans, do have the advantage of not using ionizing radiation. However, they also have their limitations and cannot routinely replace CT scans. Ultrasound images are typically less accurate, as they provide less anatomic delineation and may miss important findings. MRIs are much more expensive than CT scans and can be both claustrophobic and time-consuming.

In general, there are many variables that need to be considered when a doctor is deciding on the best choice of imaging tests: the medical conditions that are suspected to be causing the patient's symptoms, the patient's medical history and age, and the strengths and weaknesses of the various imaging tests in terms of their ability to detect the suspected cause of the patient's symptoms. Medical providers weigh these factors to make a recommendation that is personalized to each patient's situation.

When are CTs useful, and when are they not?

Just to give a couple of very common examples: not everyone who presents to their doctor's office or to urgent care with belly pain requires a CT scan of their abdomen; and not everyone with a headache needs a CT scan of their brain.

These are scenarios where a thoughtful health care provider will consider various possibilities on their differential diagnosis and assess whether a patient's symptoms can be treated or monitored for a period of time without a definitive diagnosis, rather than taking the knee-jerk reaction of ordering a CT scan right away.

Now, it may be a different story if symptoms are unremitting or particularly intense. And in certain circumstances, such as trauma or when there is a very high suspicion of cancer, CT scans become critical in the management of patients. When I care for patients with cancer, CT scans are vitally important for accurate staging, assessing treatment response, and follow-up care. These benefits far outweigh the theoretical risk of a future cancer.

How would a patient know if the lowest effective radiation dose is being used?

This is something that can be discussed with the provider who is ordering the test — or if they are not sure, then with the radiologist. Radiology departments should have established standards and protocols for the radiation doses used for specific types of CT scans, to balance the need for diagnostic accuracy with wanting to ensure maximal patient safety. For example, low-dose chest CT scans performed for lung cancer screening use lower doses than multi-phase abdominal/pelvic

CT scans that are required to stage a person with pancreatic cancer. UCSF provides information on radiation dosing as part of their radiology reports, and these are accessible to patients.

Why are children more susceptible to radiation-induced cancer?

There are two reasons. First, children's bodies are still growing, so their cells are dividing rapidly — and thus are more susceptible to cancer-causing mutations from the DNA damage caused by ionizing radiation. Second, since there is a latency period for a person to develop radiation-induced cancer — sometimes up to several decades — children have a much longer lifetime ahead of them where they are vulnerable to such cancers compared to someone in their 70s.

How should parents be on the lookout for their children?

Parents can engage in thoughtful and respectful dialogue with their child's health care provider if a CT scan is being recommended for any reason. They can ask questions like, "Is it necessary?" "What are you hoping/expecting to find?" "Are there other diagnostic approaches that might get us to the same answer?"

But if a CT scan is ultimately deemed to be the best tool — and, to be clear, in certain circumstances it is — then I would not resist getting it out of fear for the small increased lifetime risk of cancer, especially for a single test. Nor would I live afterwards in a constant state of hypervigilance and anxiety.

It's all about understanding and having a healthy perspective on the risks and benefits, which we need to do with so many other situations we encounter in our daily lives.

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