People without heart disease symptoms should use caution in obtaining cardiac imaging exams

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At the radiation dose levels used in cardiac imaging exams, such as cardiac CT or nuclear medicine scans, the risk of potentially harmful effects from ionizing radiation are low. However, since the exact level of risk is not known, people without symptoms of heart disease should think twice about seeking, or agreeing to, these types of cardiac studies. This is the conclusion of an advisory committee convened by the American Heart Association's Council on Clinical Cardiology and Council on Cardiovascular Radiology and Intervention. A Mayo Clinic cardiologist led the committee.

In the Feb. 2 online issue of the journal *Circulation*, the panel says that cardiac scans that use ionizing radiation should, in all cases, be used judiciously, and are not recommended for people without chest pain or other symptoms who are at low risk for heart disease.

"There is a false sense of security among physicians that the radiation dose received by individual patients, and the potential health risks that may come with it, can be determined precisely," says Thomas Gerber, M.D., Ph.D., a cardiologist at the Mayo Clinic campus in Florida.

The uncertainty, and long-standing controversy, centers on how to connect the low doses of ionizing radiation received by patients from medical imaging procedures to the possibility of cancer development, says Dr. Gerber.

"There is no question that large doses of radiation, such as from the atomic bomb blasts in Japan, are linked to cancer, but there is a lot of unresolved debate about whether or not, or to what degree, low doses carry cancer risks," he says.

This issue is important in cardiology, Dr. Gerber adds, because cardiac CT imaging has become very popular and is being heavily marketed directly to the public. These scans can reveal whether a person's heart arteries have plaque in them. Yet, while these devices produce "stunningly beautiful images," Dr. Gerber says, "it has not been proven that detecting plaque at an early stage will allow doctors to make decisions that help their patients live longer."

In 2006, cardiac CT accounted for only 1.5 percent of the total dose to the U.S. population from CT. "We expect that the amount of radiation exposure attributable to CT imaging of the heart will rise rapidly as the technology improves and becomes more readily available," says Dr. Gerber. "However, the benefit of performing these scans in patients without symptoms is still unclear, and patients should know that."

On the other hand, the authors say that use of appropriate diagnostic imaging studies, such as cardiac CT, fluoroscopy, and nuclear medicine studies, should not be avoided in patients with symptoms of heart disease just because of concerns regarding radiation dose. "If a person has symptoms, the benefit of using these tests to come up with a treatment plan outweighs the small potential risk," Dr. Gerber says.

The American Heart Association asked the Writing Committee to explain to doctors how radiation dose to patients is determined, as a way of helping cardiologists understand and explain the risk and benefits of imaging procedures that use ionizing radiation.

The authors state that the most widely used measurement of radiation

dose, called the effective dose, "isn't as precise as people would like to think." Because it doesn't take into account age, variations in human anatomy, or uncertainties as to the sensitivity of organs and tissues to radiation, "the effective dose applies generically to types of imaging studies but not to individual patients," Dr. Gerber says.

For perspective, the committee notes, the risk of dying from cancer related to ionizing radiation from a cardiac CT is less than the risk of drowning, or of a pedestrian dying from being hit by some form of transportation.

Additionally, the authors cite a hypothetical scenario where, if every person aged 50 to 55 in the U.S. (about 1.8 million people) were screened for heart disease with cardiac CT every five years until age 70, the estimated total increase in the number of fatal cancers over the entire 20 years might be about 43,000. Yet, if doctors could use that screening information to prevent only 10 percent of the unexpected deaths from heart disease, 35,000 fewer deaths would occur per year.

"The bottom line is that patients need thoughtful advice from their doctors as to what heart imaging test is right for them," says Dr. Gerber. "Their doctors need to understand and be able to carefully weigh the risks and benefits of these tests in each patient's special situation."

Source: Mayo Clinic