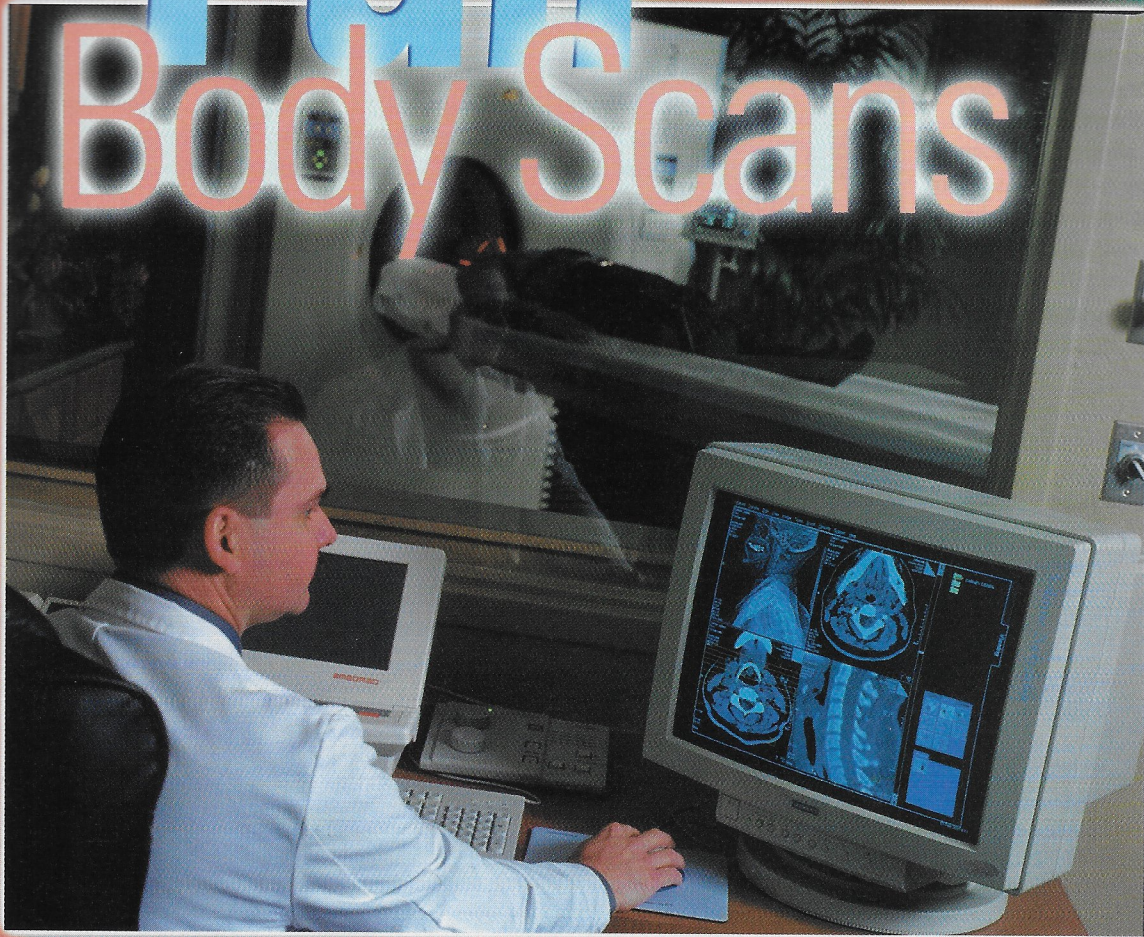


Photo courtesy of Open System Imaging



Do the **benefits**  
outweigh the **risks?**

By Tom Schaffner

**Y**ou may have seen the ads telling prospective customers that full body scans can detect serious diseases before it's too late. You may have even heard of perfectly healthy people opting to get a full body computed tomography (CT) scan, although they show no symptoms of illness and have not been recommended to do so by a physician.

**Why? And more importantly, is this preventative measure totally safe?**

For many individuals, screening offers peace of mind. Reassurance that they are free from diseases — life-threatening or not — is worth the time, expense and any radiation risks resulting from a full body scan. For others, the possibility of detecting a disease in an early and treatable stage is a factor.

However, full body CT screening may not satisfy either of these goals. A normal finding may be inaccurate, and an abnormal finding could be a benign tumor, which only causes patients needless worry, expense and testing. Abnormal test results for a benign or incidental finding could also lead to unneeded, possibly invasive follow-up tests that present additional risks to the individual.

Additionally, CT scans deliver more ionizing radiation than other imaging exams, and using CT as a screening tool may subject healthy tissue to unnecessary radiation exposure, raising the risk for incidental cancers.

### **What Is It?**

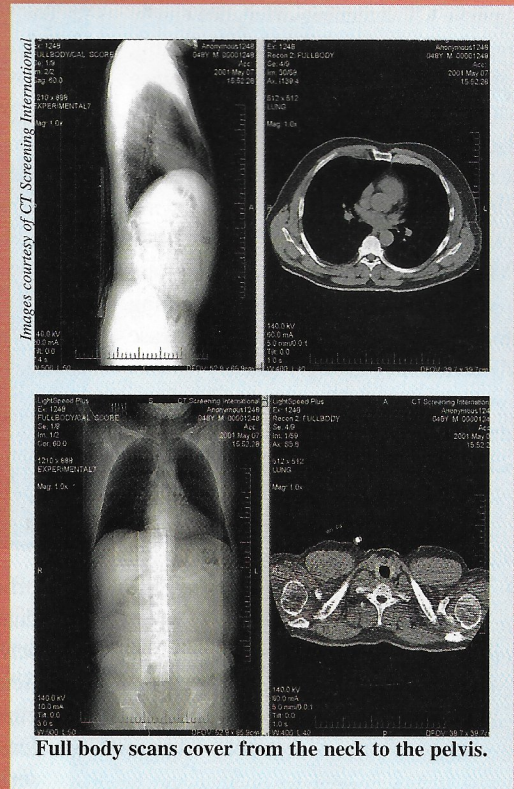
The full body (or whole body) scan differs from a traditional CT scan or positron emission tomography (PET) scan by providing vivid 3-D images of the body, which could reveal potentially life-saving information on aneurysms, cancer, heart disease, kidney and gallstones, liver and lung disease, osteoporosis, prostate disease and stroke risk.

A full body CT scan provides a detailed view of various types of tissue, including the lung, bones and blood vessels. Examinations are generally fast (as little as a few minutes on the scanning table) with an immediate diagnosis. The scanning is painless, non-invasive and could eliminate the need for invasive exploratory surgery and surgical biopsy in some cases.

Bill Seals, partner and director of business development for Open System Imaging (OSI) in Palm Desert, Calif., says that technologically, there is no difference between a traditional CT scanner and a

full body scanner. “Our CT body scans provide 2-D images [with] the same crystal clarity and are equally as diagnostic as the physician-referred CT of the same area. Both are diagnostic in viewing problem areas where symptoms are already present,” Seals says.

“However, from a software standpoint,” he says, “the two are quite different. OSI uses three software programs that provide 3-D high resolution images. The software program provides the ability to do the calcium scoring of the coronary arteries for heart disease risk assessments. The software also images the interior of the colon and reveals polyps that would not be seen two dimensionally. Both are equally diagnostic when looking for problems when symptoms already exist (from an equipment standpoint), but the CT body scan software shows greater detail in discovering diseases that are not so obvious due to lack of symptoms,” Seals says.



Proponents of full body scans believe CT screening offers outwardly healthy individuals an early warning of diseases they might not otherwise discover in time to treat. A recent healthcare study by International Communications Research in Media, Pa., sponsored by OSI, shows growing public acceptance of CT screening. More than 63 percent of the total respondents consider body scanning to be an effective tool for early disease detection in seemingly healthy people, and more than 55 percent of respondents believe that body scanning should become part of an annual physical exam.

"Since most diseases can progress for years before symptoms appear and by then, treatment may be ineffective, it is not surprising that Americans are taking control of their lives and turning toward imaging exams to determine their current health status," says Stuart May, MD, co-medical director of OSI. "Although a patient can appear to be in good health, without diagnostic imaging, it is extremely difficult to know the health of the patient's organs."

### The Official Stance

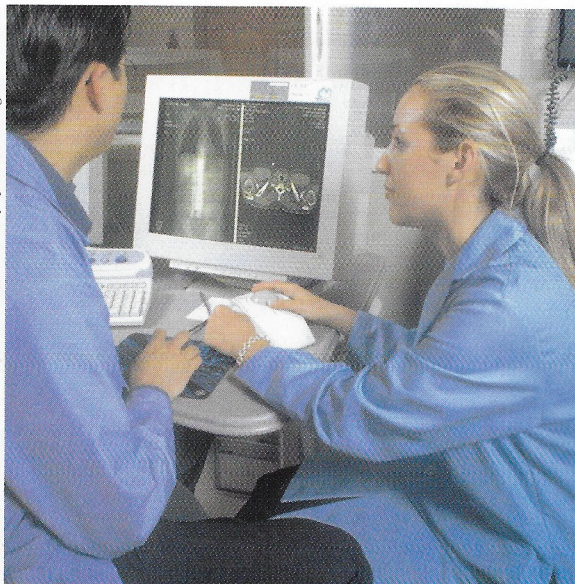
Not everyone has been as quick to support full body screening and concerns may be justified. A typical body scan can be scheduled without a physician referral, although the general public may not be aware of the radiation risks associated with repeat CT scans.

As the popularity of full body screening grows, a number of government and professional organizations have issued statements about the procedure.

The U.S. Food and Drug Administration (FDA) Center for Devices and Radiological Health (CDRH) notes that CT is beneficial when a patient exhibits suspect symptoms and the scan is used to either diagnose or rule out a disease. In someone with a positive diagnosis for a particular disease, CT can determine the extent of disease and monitor the effects of treatment. However, such use of CT in people exhibiting symptoms differs from using CT to screen people without signs of disease.

According to its Web site, the CDRH's

Photo courtesy of CT Screening International



official stance is: "There is yet to be any data demonstrating that whole body CT screening is effective in detecting any particular disease to be managed, treated or cured and advantageously spare a person at least some of the detriment associated with serious illness or premature death."

David Piraino, MD, staff physician and section head of radiology informatics at the Cleveland Clinic Foundation, says his facility believes that whole body CT has potential to be beneficial to patients, though in rigorous studies, the real benefit is still in question.

"For lung cancer screening you could detect smaller nodules with screening CT," says Piraino. "There is at least the potential that these may be at an earlier stage in the disease and potentially increase the likelihood of a cure. The studies are still out on whether you're detecting the disease early enough that your cure rate will be significantly higher or not. But there are some studies that suggest that it might be possible. We don't know for sure."

Like Piraino, most regulatory bodies are waiting for significant studies to evaluate whole body CT's value before supporting its use in healthcare. According to the American College of Radiology's (ACR) Web site, the organization's official statement on full body scanning is: "To date there is no evidence that total body CT screening is cost effective or is effective in prolonging life." In addition, the ACR is concerned that this procedure "will lead to the discovery of numerous findings that

will not ultimately affect patients' health, but will result in increased patient anxiety, unnecessary follow-up examinations and treatments and wasted expense."

The American College of Cardiology, the American Heart Association and the American Society of Radiologic Technologists have each released similar statements regarding full body scans.

### First-hand Accounts

No matter how many organizations issue statements discouraging full body screenings, there are those believers who have benefited first-hand from scans that have changed their lives.

Steven Schwab of Chico, Calif., says that he has always been proactive about preventive healthcare, including eating right and exercising. "When my wife and I saw the promotion for a whole body scan, we thought it was a good idea," he says.

"I was surprised to discover that my calcium score was five times higher than it should be. My primary care physician referred me to a cardiologist, who performed an angiogram. Fortunately, there was no blockage, but if I hadn't found out the plaque was there and started doing something about it, I could have had a heart attack sometime in the future. Without that scan, I never would have known."

David Selman of El Centro, Calif., is another believer. "When I turned 40, I thought a whole body scan would be a good baseline," Selman says. "I'm a runner and feel healthy, but there's [a history of] heart disease on my mother's side of the family, so I also wanted to see if anything was going on in that regard."

He says that the scan found a 5-centimeter tumor on his left kidney. Shortly after, Selman underwent surgery, and found that the cancer had not spread. "That scan probably saved my life," he says. "I have no known family history of kidney disease or cancer."

"It's well worth knowing you're as healthy on the inside as you feel on the outside," Selman says. "At the very least, that scan helped me avoid some potentially serious complications."

## How Much Is Too Much?

One of the main arguments from critics of the full body scan is that healthy patients, especially females of childbearing age, subject themselves to unnecessary radiation risk when they undergo a scan.

"This technology really hasn't been shown to cause cancer," May says. He points to patients who undergo radiotherapy for cancer and receive 6,000 rads of radiation, yet don't show any increased signs of cancer. "[A full body scan] uses around 1 rad. So it is 1/6000th of what radiation therapy patients receive and they don't have any increase in cancer," he says. "We can extrapolate that this technology is not going to cause cancer. Even if you have 20 [full body scans] in your lifetime, totaling 20 rads of radiation, you will still fall far short of the 6,000 rads that a radiation therapy patient would receive."

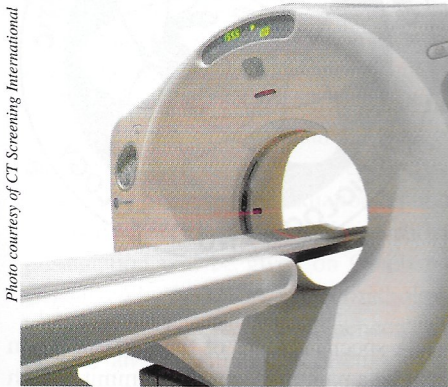


Photo courtesy of CT Screening International

Piraino adds that the amount of radiation exposure really depends on the type of scan performed, how it's done and the type of machine used.

OSI also uses magnetic resonance imaging (MRI), which does not emit ionizing radiation, for full body scans. "We might do the abdomen and pelvis screening with MRI and just do the chest with CT. The chest part is low dose. It's almost negligible."

Technology that has lowered patient dose has also made the scans safer. "Whole body screening is becoming useable because of the advances in CT technology and the ability to significantly reduce the dose as compared to CT in the past," Piraino says. There is still some radiation exposure, he adds, but the difference is approximately what a person might get from living for several years in Denver,

Colo. (a higher region for background radiation), vs. living in Cleveland (a relatively low radiation region).

The CDRH argues that CT screening subjects the patients to radiation exposure from X-rays. The dose a patient receives during a typical CT procedure is generally much larger than the radiation doses associated with most conventional X-ray imaging procedures. The principal risk associated with the radiation dose resulting to a person from a CT procedure is the small possibility of developing a radiation-induced cancer some time later in that person's life.

The CDRH stresses that, "No manufacturer has submitted data to FDA to support the safety and efficacy of screening claims for whole body CT screening."

## The Next Mammography?

May considers the anxiety overdose unnecessary and compares CT screening to mammography. "We screen millions of women for early breast cancer detection and we do find a significant number of benign tumors," he says. "That does create some anxiety, but with that we have increased the cure rate to 90 percent."

May believes whole body screening actually relieves patient anxiety. "We usually can tell by looking at some of these lesions whether they are going to be benign or malignant and we can give the patient some good odds just based on morphology and experience.

"Our feeling is that one in three people are going to get cancer sometime in their life, and their main chance for a cure is early detection. We feel that we can save a significant amount of lives by screening people at appropriate intervals. So if we can implement a technology that saves lives and cures cancer, I think we are way ahead of the game."

But until definitive results can convince organizations and administrative bodies to approve full body scans, the decision is left to the informed individual.

— Tom Schaffner is the editor of RT Image. Comments on this article are encouraged and can be directed to [tschaffner@valleyforgepress.com](mailto:tschaffner@valleyforgepress.com).



## Lowering Dose

A recent study conducted by Srinivasa Prasad, MD, a clinical fellow of radiology at Washington University in St. Louis, revealed that chest CT scans using 50 percent less radiation can provide "acceptable" images of normal anatomic structures. While standard-dose CT scans account for only 11 percent of all X-ray-based exams in the United States, they are responsible for two-thirds of total radiation dose associated with medical imaging.

While the study found that the standard-dose images to be better quality (an average 3.79 rating on a scale of 1 to 5 with 1 being the worst and 5 being excellent), the 50 percent dose images were "acceptable" (average 3.44).

"Reducing the radiation dosage used in CT scans is worth the minor sacrifice of image quality," Prasad says. He adds that recent advances in CT technology allow for faster and better images, yet physicians "should judiciously consider the risk-benefit ratio before referring their patients for a CT."

— American Roentgen Ray Society

