Seeing Through Airport Body Scans

Roger Gerard, Hospitality Management, Shasta College

Sometimes I wonder about the necessity of medical tests and procedures. About a year ago when I had symptoms of a sinus infection, I went to my local physician who ordered a CT scan. It revealed that I had a serious infection in my sinuses. Perhaps, according to another physician, the CT Scans could have been performed when there was no infection to determine the nature of the sinus cavity when clear. Yes, another one was done again, after the infection had cleared. One scan seemed to have been done unnecessarily. This was especially alarming considering recent news regarding radiation from CT scans causing additional cancer risk http://www.npr.org/templates/story/story.php?storyId=121436092 . The section of the article that caught my attention was:

> "A new study from the National Cancer Institute projects 29,000 excess cancers from the 72 million CT scans that Americans got in 2007 alone. Nearly 15,000 of those cancers could be fatal."

How long have these scans been given without the radiation levels being closely monitored? And, now, with the advent of the latest airport scanning machines, are they safe?

For my research, I went to the Transportation Security Administration (TSA) website http://www.tsa.gov/approach/tech/imaging_technology.shtm to gather some more information about the technology and its impact on the health of the traveling public. There are two basic whole body scanning technologies being employed either primarily or secondarily at major airports listed on the TSA website. The first, millimeter wave technology, uses beams of radio frequency that are projected over the surface of the body. The frequency or RF then creates a three-dimensional image of the traveler. A video on how this technology works is located at http://mfile.akamai.com/25703/wmv/tsagov.download.akamai.com/25703/htdocs/assets/wmv/l3_mwave1.asx . The second method is known as "backscatter" which uses an x-ray beam that moves quickly over the body and is converted into a computer image. A demonstration of this device is located at http://mfile.akamai.com/25703/wmv/tsagov.download.akamai.com/25703/htdocs/assets/mov/backscatter.asx . The bottom line is that millimeter wave technology relies on radio frequency energy to generate an image and backscatter relies on low intensity x-ray beams. According to TSA, the energy projected by millimeter wave is 10,000 less than a cell phone transmission. Exposure to backscatter will penetrate clothing, not skin and is equivalent to a two-minute flight that is exposed to cosmic rays. From their descriptions, one reminds me of a low energy microwave and the other a low energy x-ray machine.

The caveat appears to be with the implementation of the backscatter machines. TSA claims that this equipment has been safely tested and meets the standards indicated by the American National Standards Institute. However, one is still

exposed to radiation. Backscatter technology employs terahertz (THz) waves, which fall somewhere between microwaves and infrared. The technology allows the TSA to view non-conducting materials such as clothing and the chemical composition of anything that might be on the human body. There are mixed reports that this technology may be damaging to biological organisms. A report from the Los Alamos National Laboratory states,

> "Although the forces generated are tiny, resonant effects allow THz waves to unzip double-stranded DNA, creating bubbles in the double strand that could significantly interfere with processes such as gene expression and DNA replication." http://www.technologyreview.com/blog/arxiv/24331/

Since there is no research available on repeatedly exposing ourselves to THz or to radio waves when traveling, how do we know that it is harmless? The answer is yet to be determined. This might be an interesting question for the frequent traveler, pregnant women and children who may be more susceptible to repeated exposure. The time it takes to scan someone appears to be less with the millimeter technology, but what are the long-term effects? Potential disruption to DNA is being questioned for both technologies.

On a final note, most of the airports are endorsing the use of this security equipment as being safe, as the priority is safety when traveling. For the long term, will they cause a terminal illness such as cancer? Not sure. For years mammograms have been used routinely as a preventative measure to detect breast cancer. Now, the process is being questioned for its effectiveness and also cited as a cancer causative.

For more information on body scanners and their technology, I suggest the following sites:

http://strandedpassengers.blogspot.com/2010/01/full-body-scanners-used-on-air.html

http://www.bloomberg.com/apps/news?pid=20601209&sid=aoG.YbbvnkzU

http://www.tsa.gov/blog/2008/05/which-is-it-millimeter-wave-or.html