

Few activities capture the essence the holiday season more than the joy of time spent with friends and family. These days, seeing our cherished loved ones often requires the extra effort of hopping onto an airplane and logging some miles. While the hustle and bustle of getting ourselves packed (without going over the weight limit), arriving at the airport in time (perhaps by sweet-talking a friend into driving us), and navigating our way through the security line (with our precious carry-on cargo remaining intact) can be stressful enough, the new TSA screening regulations have added some additional stress and worry to many travelers. By sharing some information about the radiation that comes with that screening, I hope to relieve some of that angst so you can relax and focus on the best part of the holidays- sharing your favorite traditions and making memories with those you care about.

The thought of a mandatory exposure can leave us feeling upset and worried about its effect. So let's take a quick look at the radiation used in the new TSA security scanners. While traditional x-ray machines, such as those used for medical diagnostic purposes, use radiation that penetrates through a body, the TSA scanners use "backscatter" x-rays which are significantly lower in energy and are instead reflected off a body. To help us put this radiation exposure into perspective, here are a few statements made by various organizations who have studied and verified the dose from the TSA backscatter scan.

1. The National Council on Radiation Protection and Measurement (NCRP) reports that a traveler would need to experience 100 backscatter scans per year to reach what they classify as a Negligible Individual dose. [1]
2. The America College of Radiology (ACR) agrees with this conclusion and adds that a traveler would require more than 1000 scans to reach the effective dose of one standard chest x-ray. [1]
3. The ACR also states that an airline passenger flying cross-country is exposed to more radiation from the flight than from the screening by one of these devices. In fact, the 10 micro-rem of radiation that one receives per scan is equivalent to the radiation one receives inside an aircraft flying for two minutes at 30, 000 feet. [1]
4. The FDA reminds us that naturally occurring ionizing radiation is all around us. We are continuously exposed to this background radiation during ordinary living. In comparison, each TSA screening exposes the passenger to the same amount of radiation as he would receive from nature in 42 minutes of daily living. [2]

I should note that concerns regarding various issues around the scanner technology have been raised. A series of letters has been exchanged between four UCSF professors and the White House Office of Science and Technology Policy debating the topic of the dose and other biological effects. [3, 4] So far the Whitehouse and the FDA, along with the support of the Health Physics Society (HPS), and the ACR, stand firm on their conclusions. However, whenever we see "dueling experts" we know that there is still more to be learned. It is only through challenges to the science, like the one made by these professors, that the studies continue and the science progresses and we learn more about the amazing mystery that is the human body.

In the meantime, may the joy of spending time with your friends and family far outweigh any concern you may have over the process by which you get there to see them!

Susan Ryneveld Butler, M.Sc., DABR
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[1] ACR Statement on Airport Full-Body Scanners and Radiation. January 2010.
Available at:
http://www.acr.org/MainMenuCategories/media_room/FeaturedCategories/PressReleases/StatementonAirportFullbodyScanners.aspx (accessed 9 December 2010)

[2] “Products used for Security Screening of People”. FDA. Available at:
<http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/SecuritySystems/ucm227201.htm> (accessed 8 December 2010)

[3] John. W. Sedat, PhD., USCF Letter of Concern to John P. Holden, Assistant to the President for Science and Technology. 6 April 2010.
<http://www.whitehouse.gov/sites/default/files/microsites/ostp/ucsf-jph-letter.pdf>
(accessed 3 December 2010.)

[4] John P. Holden, Assistant to the President for Science and Technology. Response to the University of California – San Francisco, Regarding their Letter of Concern, Oct 12, 2010. Available at: <http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/SecuritySystems/ucm231857.htm> (accessed 3 December 2010.)