

Exposures of Radiation While Traveling

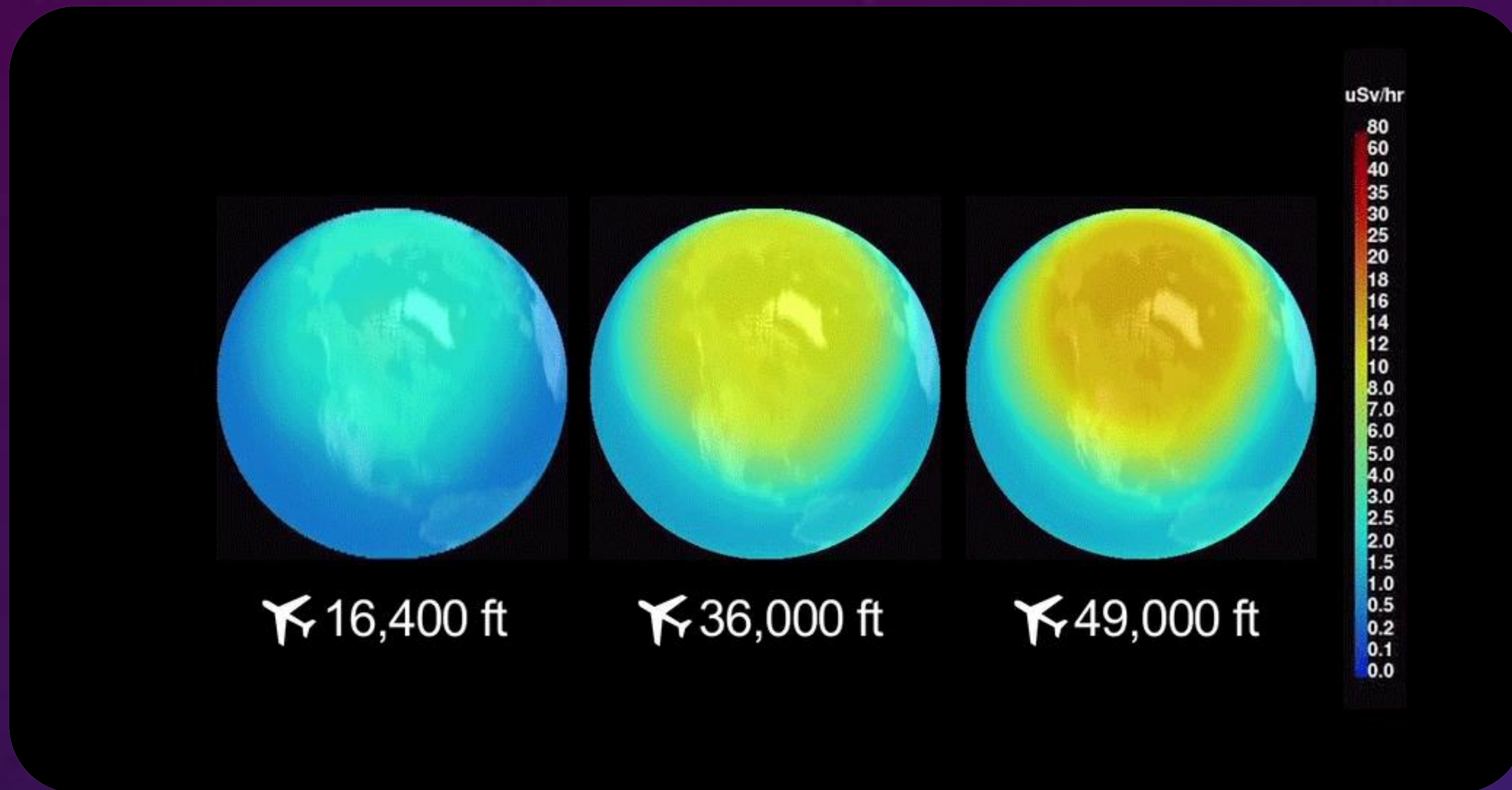
Two Types of Airport Scanners

Backscatter Scanner:

- ❖ Uses ionizing radiation
 - 0.03 microsievert to 0.1 microsievert
- ❖ Comparisons:
 - 50 scans = 1 dental x-ray
 - 1,000 scans = 1 chest x-ray
 - 200,000 scans = 1 abdomen/pelvis CT scan

Millimeter-Wave Scanner:

- ❖ Uses radio waves
- ❖ How it works:
 - Radio wave reflects off travelers body
 - Signal created
 - Signal gets sent to transceiver
 - Transceiver sends emitted signal to computer
 - Computer creates image



Sharghi, K. (2012, November 20). [Radiation Dose Rates At Various Altitudes]. Retrieved December 6, 2017, from <https://svs.gsfc.nasa.gov/11126>

Exposure In The Air

Factors that increase exposure to radiation

1. Latitude

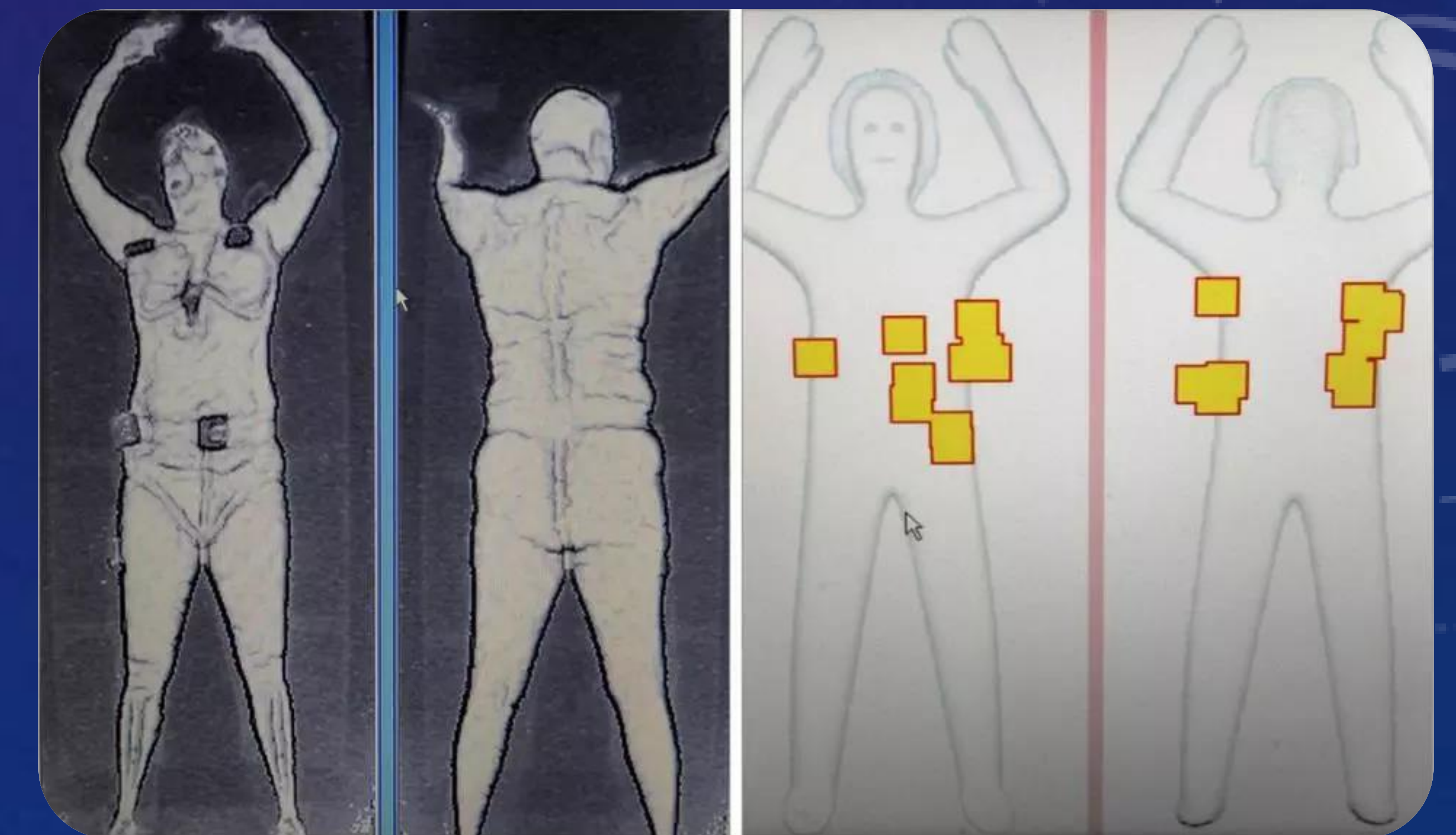
- Magnetic field surrounding earth repels cosmic rays away from equator
- More cosmic rays near north and south poles
- Farther from the Equator = increase in radiation

2. Higher altitude

- Thinner air = less gas molecules per volume of space
- Less molecules = less protection from cosmic rays

3. Length of flight

- Increased time in air = prolonged exposure to radiation



Ryan, D. L., & G. (2012, October 4). [Revealing images, left. Now, gender-neutral outlines, right, are visible to traveler and TSA]. Retrieved December 5, 2017, from <https://www.bostonglobe.com/business/2012/10/04/tsa-unveils-new-less-revealing-body-scanners-logan/ocE7Ev788XpHzvmIMAVIMN/story.html>

REFERENCES

- 3-D Body Holographic (millimeter wave) Scanner. (2017, August). Retrieved November 14, 2017, from <http://availabletechnologies.pnnl.gov/technology.asp?id=35>
- Borsuk, R., Coghill, K., & Lyn, T. E. (2011, March 15). Factbox: How much radiation is dangerous? Retrieved November 26, 2017, from <https://www.reuters.com/article/us-japan-quake-radiation/factbox-how-much-radiation-is-dangerous-idUSTRE72E14R20110315>
- Jorgensen, T. J. (2017, June 07). Air travel exposes you to radiation – how much health risk comes with it? Retrieved November 16, 2017, from <http://theconversation.com/air-travel-exposes-you-to-radiation-how-much-health-risk-comes-with-it-78790>
- Publishing, H. H. (2011, July). Are full-body airport scanners safe? Retrieved November 14, 2017, from <https://www.health.harvard.edu/diseases-and-conditions/are-full-body-airport-scanners-safe>