Radiation

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Cosmic Radiation

Click **here** for basic information on cosmic and solar radiation

2018 update: Researchers at the [Harvard School of Public Health](https://www.hsph.harvard.edu) found that U.S. [Flight Attendants have a higher prevalence of every cancer](https://www.hsph.harvard.edu) they studied, especially breast cancer, melanoma, and non-melanoma skin cancer. More details posted below.

**Collectively, airline crews are classified as the highest-exposed radiation workers in the US.** The two main sources of radiation are “cosmic” (from other stars) and “solar” (from our sun). Exposure to these forms of radiation is not much of an issue on the surface of the earth because the atmosphere serves as a protective layer. But inflight, you have less of that protective layer above you, so your exposure to the radiation is higher. In Europe, airlines must monitor crews' radiation doses and ensure protections for female crews who choose to report their pregnancy. But in the US, there are no rules to protect crews from over-exposure. For that reason, it is important to educate yourself on inflight radiation basics, especially as they relate to pregnancy. To that end, check out this page and also AFA’s [reproductive health](https://www.ashsd.afacwa.org) webpage. One key message is if you are pregnant, [check for solar storms](https://www.ashsd.afacwa.org) before you fly. Also, we recommend that all crewmembers check out the second edition of **“The Invisible Passenger: Radiation Risks for Those Who Fly.”** It’s very readable and packed with information - essential reading for crews! AFA members receive a 20% discount – just enter AMPAFA in the “discount” box right before you click “send order.”

**A future app may enable crews and passengers to monitor their inflight radiation dose in real time**, based on detailed data collected during 258 high-latitude flights…

**Concern raised over backscatter (X-ray) security scanners:** When you walk through a backscatter security scanner, it feels like you are walking between two tall freezers, not to be confused with a millimeter wave unit in which you stand in a glass booth and are not exposed to X-rays. There are conflicting reports over whether you should be concerned about the radiation dose delivered by the backscatter security scanners being installed at a growing number of airports, especially if you are pregnant, trying to get pregnant, over 65 or traveling with children. The TSA notes that the radiation dose from the backscatter devices is very small compared to your radiation dose inflight from the sun and stars. Conversely, [experts at UCSF raised their concerns with the White House in April 2010](https://www.ashsd.afacwa.org), noting that the radiation is delivered directly to the skin (potentially increasing the risk of skin cancer) and that the radiation dose can vary depending on the machine operator and any malfunctions. The [FDA responded to the UCSF scientists](https://www.ashsd.afacwa.org), but
didn’t address all of the concerns. Ultimately, the radiation exposure risks of the backscatter devices are not yet well-defined, while radiation exposure in glass booth scanners is under study, but is likely okay. Fortunately, flight attendants are not required to use either device. If you want to avoid exposure to radiation, tell the TSO that you want to walk through the metal detector instead, followed by a standard pat-down if the metal detector alarm sounds.

**Cancer risk for flight attendants:** Researchers at the Harvard School of Public Health found that U.S. Flight Attendants have a higher prevalence of every cancer they studied, especially breast cancer, melanoma, and non-melanoma skin cancer. Flight attendants are a healthy worker group with smoking and obesity rates far below the national average, so their cancer rates should be lower, not higher. The researchers could not define why the cancer rates are higher but they identified workplace cancer risks for flight attendants that are consistent with those higher rates. Neither the FAA nor OSHA have properly addressed workplace health risks for flight attendants, which include radiation, fatigue, and chemical exposures. Link to full text of study above. Also, see [AFA-CWA President statement](http://www.cwaionline.org/pressroom/pressrelease.cfm?releaseid=206) online. Historically, cancer research has found an increase in breast cancer risk for female flight attendants and malignant melanoma for all flight attendants. Some studies note increased risk of cancers of the prostate, brain, and bone. Read about the importance of screening tests to detect any cancer early. For more information, see the [Komen Breast Cancer Site](http://www.komen.org), the [American Cancer Society](http://www.cancer.org), and the [National Cancer Institute](http://www.cancer.gov).

**Pregnant or planning to be?** Visit our [Reproductive Health webpage](http://www.cwaionline.org/pressroom/pressrelease.cfm?releaseid=206) to assist you and your doctor in deciding when and how much to fly, as well as what benefits may be available.

**AFA activity and hot topics**

2016 *Information on benefits that may be available during pregnancy* (Also, visit our [reproductive health webpage.](http://www.cwaionline.org/pressroom/pressrelease.cfm?releaseid=206))

2010 *Cosmic and solar radiation: facts for flight attendants* Updated information bulletin on the potential health risks associated with exposure and the regulatory situation in the US and beyond. Association of Flight Attendants-CWA, AFL-CIO

2008 *Information on how to identify solar particle events* Check [this website](http://www.cwaionline.org/pressroom/pressrelease.cfm?releaseid=206) before going to the airport. If the green line is above "10 to the zero" on the left side of the graph, it is recommended that pregnant women postpone travel. To help you interpret the graph that you see on your computer screen, here is an example of a graph with no Solar Particle Event (SPE) and here is one with a SPE of health significance. The [NOAA Space Weather Prediction Center](http://www.cwaionline.org/pressroom/pressrelease.cfm?releaseid=206) will also notify you of these solar events for free by email. **This is especially important information if you are pregnant.** Register as a user, then click on "aviation", "subscribe", "solar radiation events", and then check the following five boxes: (1) WARNING: proton event 10 MeV > 10 PFU expected; (2) ALERT: proton event 10 MeV, exceeded 100 PFU; (3) ALERT: proton event 10 MeV, exceeded 1,000 PFU; (4) ALERT: proton event 10 MeV, exceeded 10,000 PFU; and (5) ALERT: proton event 10 MeV, exceeded 100,000 PFU

June 2006 *FAA denies AFA request for basic radiation protections*

May 2006 *AFA asks the FAA for basic regulations to inform and protect crewmembers*
May 2006 **AFA submits comments to the Space Environment Center**, asking for assurances of funding to continue the SEC monitoring and reporting system for solar particle events. (SEC has since changed its name to the Space Weather Prediction Center)

Apr 2006: **Transport Canada updates its recommended radiation protections for crewmembers**: Issued as Commercial & Business Aviation Advisory Circular No. 0183R (first published in 2001)

Aug 2005 **AFA asks FAA Administrator to save CARI program** Letter to Administrator Blakey that describes the importance of funding the CARI program that is currently used worldwide to track an individual’s dose of galactic radiation during commercial airline flights. (The FAA responded on Sept 12, 2005, assuring AFA that the CARI program will not be cut.)

2003 **Published assessment of the health risks** associated with radiation exposure of crewmembers, citing legislation passed in 2000 to compensate nuclear power plant workers for negative health effects believed to be caused by their radiation exposure which is about half of what the typical air crewmember gets. (Thanks to APA for bringing this paper to our attention.)

Dec 2003 **What has the AFA done to learn more about the potential risks?** Association of Flight Attendants, AFL-CIO

Nov 2003 **Study on breast cancer risk among Icelandic flight attendants** Research paper by Rafnsson et al reported a significant increase in breast cancer risk among flight attendants, even after adjusting for reproductive factors.

Oct 2000 **FAA acknowledges that the mother’s belly does not shield her baby from galactic radiation** Document published by the US Department of Transportation, Office of Aviation Medicine, DOT/FAA/AM-00/33


**More information**


2006 **Advisory Circular 120-61A** Replaces AC 120.61 and 120.52 that were published in 1994 and 1990, respectively
1998 Summary of article on exposure to in-flight radiation during pregnancy Author DS Geeze

13 May 1996 Legislative protections for European crewmembers Article 42 of Directive 96/29/EURATOM. Adopted by the Council of the European Union on 13 May 1996. Member States required to implement the Directive by 13 May 2000. See also Implementation of Article 42 in the United Kingdom

19 May 1994. Advisory circular (guidance material) AC No. 120-61 Recommends that the airlines provide crewmembers with educational materials that describe the potential radiation exposures and associated health risks (Has been widely ignored.) US Federal Aviation Administration.

5 Mar 1990. Advisory circular (guidance material) AC No. 120-52 Recognizes crewmembers as being occupationally exposed to radiation and lists estimated radiation exposure levels according to flight route, assuming normal solar activity. US Federal Aviation Administration.

Space weather alerts and displays Hosted by the Space Weather Prediction Center, National Oceanic & Atmospheric Administration.

Space Weather Science news and information about the sun-earth environment. Hosted by the National Aeronautical & Space Administration

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