



In-Flight Radiation and Cancer

What You and Your Doctor Need To Know

Introduction

The radiation that you are exposed to during a flight is elevated compared to ground-based levels because the protective layer of atmosphere above you is thinner. You might think that the fuselage would block some of the radiation but it does not. Depending on the intensity and duration of your exposure, radiation can put you at increased risk for certain cancers and reproductive health problems. Under normal conditions, lower altitude and latitude flights are not considered to be a concern, but the impact of regularly flying high altitude and latitude flights needs attention. Of particular concern is flying during solar storms (also called "solar particle events") where the radiation levels can quickly rise by as much as 1000 times and stay that high for a day or two. The most recent solar storm was December 13, 2006 and it came with little warning. There are an average of two or three big solar storms each year.

This article summarizes key cancer research to provide you with some answers to questions about the risks to flight attendants. Flight attendant health studies typically only include females so we also describe health studies of male pilots since the exposures are similar. Reproductive health issues are not covered here, but visit our radiation page (see below) or call the number at the bottom of this article.

Background to help you interpret the research on cancer

The studies published on cancer rates among crewmembers do not all point in the same direction, although the majority of studies report an excess risk of **breast cancer** among female flight attendants and an excess risk of **skin cancer** among all flight attendants. Some studies report an increase in other types of cancer including **brain, bone, and prostate**. Many of the articles suggest that occupational exposures such as elevated radiation levels, pesticides, and jet lag may explain the observed cancer risk. Other studies note that it is not possible to rule out the impact of "lifestyle factors" like sunbathing (for skin cancer) or having a first child later in life (for breast cancer). This is difficult to dispute because most studies don't collect that information. However, what we can say is that radiation is known to increase the risk of many cancers (including those listed above) and certain pesticides, exposure to electromagnetic fields (EMF), and disrupted melatonin production have been implicated in breast cancer. We also know that many flight attendants face these hazards on a regular basis in the aircraft cabin. Finally, we know that these exposures in the aircraft cabin are unregulated and nobody is keeping track.

Cancer research

Recent reports indicate that the rate of breast cancer among American women dropped significantly, attributed to doctors no longer recommending hormone therapy to control symptoms of menopause because the hormones were effectively feeding breast tumors. This decline in breast cancer risk should be reflected among flight attendants who may otherwise have opted for hormone therapy; however, other breast cancer risk factors, including workplace exposures, have not changed. Here is a summary of the research to date:

AFA has been informed that a study soon to be published in the Journal of Fertility & Women's Medicine found a significant increased risk of breast cancer among female flight attendants. This confirms the results of two recent reviews of multiple studies that found an increased risk of female breast cancer (as well as melanoma), and one recommended that all airlines estimate radiation dose, use scheduling to ensure that crewmembers are not overexposed, inform crew of health risks, and give special protections to pregnant women (Buja, 2006; Tokumaru, 2006).

A 2005 study found no relationship between estimated radiation dose (based on trips flown under assumed normal solar conditions) and breast cancer. However, these conclusions must be interpreted carefully because the researchers did not attempt to measure the impact of flying during solar storms on radiation dose and breast cancer risk (Kojo, 2005).

A 2003 study reported that flight attendants in Iceland who had worked for five or more years were significantly more likely to develop breast cancer. These findings are particularly significant because the researchers actually controlled for age at first childbirth, which is a big non-occupational risk factor for breast cancer, drawing more attention to occupational risk factors such as radiation (Rafnsson, 2003).

Closer to home, a study of AFA members in CA reported a 30% increased risk of breast cancer compared to the general population (Reynolds, 2003), and cited jet lag, EMF, and cosmic radiation as occupational factors that could contribute to increased breast cancer risk.

A 2002 study of male Nordic pilots reported an increased risk of skin cancer (Pukkala, 2002), and a 2000 study found that male pilots were more likely than expected to die from melanoma or brain cancer, or be diagnosed with prostate cancer. Those researchers also found that female flight attendants had an increased risk of being diagnosed with all cancers (combined), in particular breast cancer and melanoma.

Researchers in NJ studied a group of retired female flight attendants who had worked for a major US airline and reported an overall excess of cancer and a two-fold increase in breast cancer (Wartenberg, 1997). They suggested that some combination of exposure to radiation and the insecticide DDT may be to blame.

A study of Finnish female flight attendants also found a significant increased rate of breast cancer (Pukkala, 1995). In fact, the only two studies to date that have not found a significant increase in breast cancer risk among female flight attendants are a large review of cancer rates in Europe and a smaller Norwegian study (Zeeb, 2003; Haldorsen, 2001).

Finally, a study of Canadian male pilots found a significant increase in risk of prostate cancer and acute myeloid leukemia (Band, 1996), and a smaller study of Canadian pilots suggested an increased risk of brain cancer and Hodgkin's disease (Band, 1990).

What can you do with this information?

Limiting your long haul, high altitude, high latitude flights would reduce your dose of radiation, but it is no guarantee of safety and many people do not want to modify their flying schedules. Canceling flights during solar storms would reduce your dose of radiation, but there are no enforceable protections to allow you to do this without penalty. (Because a developing child is more prone to the ill effects of radiation, it is not a good idea for pregnant women to fly during solar storms. Visit our radiation webpage.) To reduce non-occupational risk factors, sunscreen, regular exercise, limiting fatty foods, and a diet high in antioxidants are recommended. The prognosis for cancers of the breast, prostate, and skin can be significantly improved if they are detected early. Let your doctor know that cancer research has identified flight attendants to be at increased risk. Talk to your doctor about options for screening tests to ensure that no cancer is left unchecked. For skin cancer, monitor your body for any growing moles or discolored skin. For breast cancer, the American Cancer Society recommends a combination of self breast exams, clinical breast exams, and mammograms, depending on a woman's age. Age is the primary risk factor for prostate cancer, but screening tests are available. For more cancer information, visit www.cancer.org and www.cancer.gov. For more radiation information, visit the AFA International webpage at <http://ashsd.afacwa.org> and click on the "health" pull down menu. If you would like a copy of any of the studies cited in this article or have any other questions, contact AFA's Judith Murawski at murawskiAFA@earthlink.net or 206-932-6237.