**Radiation causes breast cancer.**

Last October during "National Breast Cancer Week," I attended a "Town Meeting" sponsored by the cancer unit of our local hospital and by our Anne Arundel County Health Department. At the podium, our county health officer, Fran Phillips, described an "epidemic" (her word) of breast cancer among the female residents of our county: one in every nine women gets breast cancer now, and the situation grows a bit worse each year.

I was expecting to hear then about the causes of breast cancer: too much fat and too little fiber in the diet, and so forth. (See REHW #389.) Given that this was 1994, I was wondering whether we might also hear the word "pesticide" mentioned, or "estrogen" or "radiation." To my surprise, Ms. Phillips described the causes of our breast cancer epidemic this way: "Lifestyle factors, over which we have no control." That single sentence was the only mention of causes, or prevention, of breast cancer during the whole evening. For the remainder of the meeting, locally-prominent surgeons and radiologists described a Breast Cancer Center of Excellence now being built onto our local hospital with federal funds, where breast cancer will be "managed" by up-to-date techniques. The bulk of the meeting was given over to various oncologists (cancer doctors), x-ray therapists, and plastic surgeons who described the benefits of mammography, x-ray-guided needles for detecting breast-tissue samples, and reconstructive surgery.

Mammography means taking an x-ray picture of a breast to detect a cancer growing inside it. Mammography has nothing to do with preventive medicine; it detects cancers that have already occurred. Reconstructive surgery is a branch of plastic surgery. After a breast has been sliced off to prevent a cancer from spreading and killing the patient, plastic surgeons can build a new "chest mound" and can even dummy up a fake nipple. I could tell from the tone of things that this was supposed to be good news. In fact, the tenor of the evening was altogether up-beat, positive, optimistic. The local medical community was clearly pleased with its response to the breast cancer epidemic this way: "Lifestyle factors, over which we have no control." That single sentence was the only mention of causes, or prevention, of breast cancer during the whole evening. For the remainder of the meeting, locally-prominent surgeons and radiologists described a Breast Cancer Center of Excellence now being built onto our local hospital with federal funds, where breast cancer will be "managed" by up-to-date techniques. The bulk of the meeting was given over to various oncologists (cancer doctors), x-ray therapists, and plastic surgeons who described the benefits of mammography, x-ray-guided needles for detecting breast-tissue samples, and reconstructive surgery.

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It should be obvious to almost everyone that all of this really represents a colossal failure. To be blunt, the measures outlined during our Town Meeting add up to a jobs maintenance program for oncologists, chemotherapists, plastic surgeons, and the large support staff that a Center of Breast Cancer Excellence requires, and of course for x-ray technicians and the corporations that make x-ray machines and film. Breast cancer is an eminently preventable disease, in the true sense of that word: making breast cancer NOT HAPPEN by preventing unnecessary exposures to carcinogens (cancer-causing agents). One might expect that the medical community would be taking the lead in preventing breast cancer, not merely "managing" it after it happens. But one would be disappointed in this expectation.

What is the major cause of breast cancer? Twenty-seven peer-reviewed scientific papers and technical reports have now identified radiation as a cause of breast cancer in women. The first such report appeared in 1965, and since then the evidence has mounted at the rate of nearly one new study each year for 30 years. The evidence has been presented repeatedly in the JOURNAL OF THE NATIONAL CANCER INSTITUTE; in the NEW ENGLAND JOURNAL OF MEDICINE; in the LANCET; in the BRITISH MEDICAL JOURNAL; in the BRITISH JOURNAL OF CANCER; in CANCER; and in RADIATION RESEARCH. Evidence has been gathered by studying breast cancer among women in many countries exposed to many different sources of radiation. RADIATION IS A KNOWN CAUSE OF BREAST CANCER IN WOMEN; it is not speculative or uncertain. It is widely accepted. It is just not widely discussed.

Radiation is not the ONLY cause of breast cancer. Inherited genes, certain chemicals including natural estrogen and estrogen-mimicking industrial compounds, some viruses, and perhaps other factors may also cause breast cancer --whether alone or together with radiation. But reducing radiation to women's breasts would definitely reduce the number of future breast cancers; or together with preventive measures, like non-irradiated breast-biopsies. PREVENTING BREAST CANCER, examines this problem head on. Here is what is known with certainty:

**Radiation of the female breast causes a particular “risk” of cancer in the exposed individual. But when a large group of women are exposed, an individual's RISK becomes a RATE of occurrence.** When a group is exposed, the risk no longer means maybe: it means cancer for someone. For example, if an individual's risk from a mammogram at age 33 is one in 1112 of getting cancer some time during her remaining lifetime as a result of the mammogram, then in any group of a million women having that procedure, the rate of breast cancer will be 1,000,000/1112 and about 899 out of the million women can be expected to get breast cancer, on average. [This does NOT mean that mammograms should be abandoned. It means they should be given with the minimum radiation dose and frequency really NEEDED to save lives. Doctors at the Anne Arundel County meeting offered evidence that a series of annual mammograms prior to age 50 doesn't save lives. Thus, for most women, a single baseline mammogram in the early 30s, followed by annual mammography after age 50, seems to save lives, according to current knowledge. But PLEASE DON'T TAKE OUR WORD FOR IT; ask your doctor.]

**The latency period --the delay between irradiation of the breasts and the onset of a resulting breast cancer --varies by decades for people irradiated at the same age. Therefore, to explain today's epidemic of breast cancer, it is necessary to study irradiation of women decades ago.**

**Breast irradiation received by females during infancy and childhood increases their rate of breast cancer in adulthood. The increase first appears as an increased incidence (occurrence) of breast cancer in women younger than 35 (“early onset” cancer), but it continues for at least another 40 years and perhaps longer.**

**The response to radiation is most severe at the youngest ages. Studies of Japanese A-bomb survivors irradiated at various ages (from less than one to greater than 50) and studied for 35 years (1950 to 1985) have shown that each unit of radiation (called a rad) causes about 10 times as much breast cancer among women age 9 and below, compared to woman age 50 and above.**

**Breast cancer is more easily caused by radiation than are other kinds of cancers.** This information is also derived from the Japanese A-bomb survivors. Compared to “all cancer sites combined,” breast cancer is about 2.5 times as likely to occur from a certain exposure to radiation. For some reason --not understood--female breasts are 2 to 3 times as susceptible to cancer from radiation as are other human tissues and organs.

**There is no safe dose of radiation.** Again, this information has been derived from direct observation of humans irradiated in Hiroshima and Nagasaki. As John Gofman says, "By any reasonable standard of biomedical proof, this issue has been settled.... Any exposure to ionizing radiation carries with it some risk to the individual and, where a group is concerned, that individual risk translates into a specific rate of cancer occurrence. The only safe dose is zero.

Dr. Gofman calculates that at least 66% --and perhaps as much as 75% -- of today's 182,000 new cases of breast cancer each year have been caused by past medical uses of x-rays, radium therapy, and fluoroscopy. A fluoroscope is a motion picture, and it delivers considerably more radiation than an x-ray."

Rachel's Environment & Health News  
#443 - Radiation Causes Breast Cancer  
May 24, 1995  


There is no book that has had a more profound impact on the American public than John Gofman's Preventing Breast Cancer. One of Gofman's most important contributions to the understanding of the relationship between breast cancer and radiation is his demonstration that breast cancer is more easily caused by radiation than are other kinds of cancer. This information is also derived from the Japanese A-bomb survivors. Compared to "all cancer sites combined," breast cancer is about 2.5 times as likely to occur from a certain exposure to radiation. For some reason --not understood--female breasts are 2 to 3 times as susceptible to cancer from radiation as are other human tissues and organs.

Dr. Gofman calculates that at least 66% --and perhaps as much as 75% -- of today's 182,000 new cases of breast cancer each year have been caused by past medical uses of x-rays, radium therapy, and fluoroscopy. A fluoroscope is a motion picture, and it delivers considerably more radiation than an x-ray.
The bulk of Gofman's book is a quantitative assessment of past exposures of women's (and girls') breasts by an astonishing variety of medical radiation given between 1920 and 1960: x-ray therapy for enlarged thymus (a gland behind the breast plate); x-ray therapy for acute or chronic mastitis (inflammation of breast or nipple); x-ray during treatment of tuberculosis; mass x-ray screening to detect tuberculosis; x-ray for teenage scoliosis (curvature of the spine); x-ray therapy for bronchial asthma; pre-birth x-rays as a result of mother's pelvic and abdominal exams during pregnancy; x-ray treatments for hyper-thyroidism and for whooping cough; radiation from fallout after A-bomb testing in the atmosphere; general diagnostic x-rays and fluoroscopies; occupational exposures of nurses, doctors, and technicians from x-rays and the gamma rays from radium-226; x-rays during chiropractic exams; x-ray therapy for pneumonia. These exposures are quantified, always erring on the low side, by Dr. Gofman.

But Gofman also discusses other x-ray exposures that he cannot quantify, but which he knows occurred: x-ray treatment of 80 different skin disorders by dermatologists; x-ray treatment of freckles and acne by beauty-parlor operators (yes, some up-to-date beauty parlors had x-ray machines installed); x-ray exposures to girls and women using, or sitting near, fluoroscopic shoe-fitting machines in many shoe stores in the '40s and '50s. The list goes on. X-ray therapy for arthritis; x-ray treatment for many inflammatory diseases and for pus-forming infections; for viral infections such as herpes; for bursitis and tendinitis; for burns; for neuritis; for pancreatitis; for peptic ulcer; for thyroiditis. You name it, someone probably tried to cure it with x-ray therapy, and excessive use of radiation today is still common, especially fluoroscopy.

Gofman says women need to protect themselves from this scourge, not trusting anyone else to protect them. He offers 5 suggestions aimed at preventing more unnecessary breast cancer:

1. Inform the media that radiation is a KNOWN cause of breast cancer.

2. Challenge your doctor by asking how much radiation you will be getting and what the odds of harm are. Even if your doctor is referring you to a radiation specialist for treatment, he or she should know what the consequences of that referral will be for you --and for millions of women like you. If your doctor won't tell you, chances are he or she doesn't know. Make the medical establishment confront its own ignorance.

3. Meet with the deans of medical schools. Discuss how they are educating tomorrow's doctors.

4. Gofman suggests offering cash prizes to doctors and radiologists who come up with new ways to minimize breast irradiation. Except in the field of mammography, where exposures have already been minimized, there are still many opportunities to minimize routine exposure of breasts, he says.

5. Existing and new watchdog groups could identify all sources of radiation to women's breasts and see that each exposure is minimized to the extent possible. Such a project (dull as it may sound) offers unique, important organizing possibilities. Think about it.

GET: John W. Gofman, PREVENTING BREAST CANCER (San Francisco, Calif.: Committee for Nuclear Responsibility [P.O. Box 421993, San Francisco, CA 94142], 1995); $15.00 and a bargain at that price.

--Peter Montague

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Descriptor terms: breast cancer; national breast cancer week; carcinogens; prevention; chemotherapy; carcinogens; statistics; morbidity; mortality; mammography; radiation; john gofman; hiroshima; nagasaki; nuclear weapons; a-bomb; x-rays; fluoroscopy; scoliosis; thymus; tuberculosis; asthma; thyroid disease; whooping cough; occupational safety and health; pneumonia; dermatitis; arthritis