

From: Lynn H. Ehrle  
Sent: Thursday, September 11, 2003 9:39 PM  
To: Wolfe, Mary (NIH/NIEHS)  
Subject: Re: ROC X Radiation background document

Dear Dr. Wolfe,

I assumed my analysis would become part of the permanent record and you have my permission to include it. At some point I would encourage the Board to set up a teleconference where there might be an opportunity to discuss some of the pertinent issues with members who may have questions or comments. In the interest of full disclosure, I should indicate I am not a doctor but a retired social studies teacher. My involvement in radiation health effects dates back to the early 1970s when, as V-P and energy comm. chair of the Consumer Alliance of Michigan, I prepared and presented numerous briefs in utility rate cases before the Mich. Public Service Commission and was twice-nominated to a post on that body. I have taught at every level(elementary,jr. high, sr. high, community college, university, and adult ed) and established a consumer economics course that was adopted as a cognate to satisfy the one-year senior poli sci graduation requirement and I edited the first comprehensive consumer-oriented textbook in 1970, *Consumer Rights:Battle in the Marketplace*. The question of radiation health risk is highly politicized, made more so by the Health Physics Society's March 1996 Position Statement that concluded, "Below 10 rem(which includes occupational and environmental exposures), risk of health effects are either too small to be observed or are non-existent." Perhaps the Board could sponsor a debate on this topic, and I would relish the chance to participate. The Father of Health Physics, Karl Z. Morgan, founded HPS and became its first president. In later years he repudiated its positions when it began to be heavily influenced by the nuclear power Industry. My review of his memoir, *The Angry Genie*, appeared in the March 22, 2000 issue of JAMA and, another review of John Gofman's book, *Radiation from Medical Procedures in the Pathogenesis of Cancer and Ischemic Heart Disease*, was published at about the same time in the Mar/Apr issue of the journal *Health Affairs*. You should know that Gofman was appointed associate director of the Lawrence Livermore Natl. Lab in 1963 and established its Biomedical Research Division at the behest of the Atomic Energy Commission(He had worked under Nobel laureate Glenn Seaborg on the Manhattan Project) but was defunded in 1970 when he had the temerity to call for a 5-year moratorium on the construction of nuclear power plants because of the radiation risk to workers and the population. Even though many of his conclusions have now become widely accepted, e.g., there is no safe dose(threshold), he is viewed by many whom I have interviewed as "outside the mainstream." It would be a travesty if his extensive Public Comments and 28 authoritative references were to be ignored by the Board as it deliberates this long overdue ROC submission.

Lynn H. Ehrle

p.s. I trust you will enter these comments on the public record.

From: Lynn H. Ehrle  
Sent: Thursday, September 11, 2003 5:20 PM  
To: Wolfe, Mary (NIH/NIEHS)  
Subject: ROC X Radiation background document

Dear Dr. Wolfe:

In reviewing the background document on X radiation, there are major gaps and distortions, a few of which I describe below.

1. The document states that cancers of the thyroid, breast, and lung are associated with radiation exposure, and that these associations have been found at doses as low as 0.2 Gy(20 rad). RERF researchers Pierce, Shimizu, Preston, Vaeth, and Mabuchi show in Table I that 33.8% of the 50113 A-bomb survivors received a weighted colon dose of 0.5-2 rad; 65.5% received <10 rad; 76.5% received 20 rad or less(Radiat Res 1996;146:1-27). The conventional wisdom persists in referring to the RERF Life Span Study as a high dose study. This study is referenced but the low dose figures are ignored.
2. Document: "medical exposures are very small compared to the exposure to natural sources of radiation." The document quotes BEIR-V figures that show 82% of radiation is from natural sources(2/3 from radon), with only 15% from medical procedures and 1% occupational. The document never mentions studies that estimate there are about 600 million radiological procedures in the U.S., 60 million of which are CT scans which account for 2/3 of dose from all procedures, nor does it cite the BEIR-V statement that a one rad whole body dose of gamma radiation will result in 8 future deaths per 10,000 exposed persons, with a double effect for children. Radon effects have consistently been overstated.
3. Document: "Low energy neutrons such as fission neutrons are significantly more potent carcinogens than low-LET radiation, such as X or gamma rays," but it then states, "There are no adequate epidemiological data available to evaluate the carcinogenicity of neutrons in humans." This is an example of the "fuzzy" scientific thinking found throughout the document.
4. Document: The claim is made that the effective average dose from brain, abdomen-pelvis, chest, abdomen, chest-abdomen-pelvis, and pelvis CT scans is 620 mrem(0.62 rad). An analysis of the typical patient radiation dose, using acrylic phantoms, found a single adult body CT delivered a 1.5-3.5 rad dose at settings of 100-300 mAs; pediatric dose, at same settings ranged from 2.9-6.8 rad and the head dose for adults is 6.0-11.5 rad and the pediatric dose measured in a range of 7.8-15.2 rad at mAs of 350-560(Nickoloff E. Pediatr Radiol 2002;32:250-260). There is no reference in the entire document to the important ALARA Conference in Chicago(Aug.2001) nor its proceedings summarized in the entire issue of Pediatric Radiology, April 2002, a serious omission.
5. Document: "Women who received multiple X-ray examinations for scoliosis as children were found to be at somewhat higher risk of developing breast cancer even though the dose to the breast was estimated to be relatively low(0.13 Gy)." NCI's 40-year follow-up(U.S. Scoliosis

Study, Spine, Aug.2000) found a 69% increase in excess breast cancers, a bit more than "somewhat higher risk," not referenced in the Document.

6. My Public Comment on the Draft Document, September 5, 2001, referencing the Feb. 2001 Amer. J Roentgenology, which had three articles on the need to reduce dose from pediatric CT examinations, the lead article by David Brenner et al, quantifying 500 excess future cancer deaths from 600,000 pediatric head and body CTs, again, not referenced.

7. Dr. John Gofman gave the committee a lengthy Public Comment on Sept.11, 2001, containing a long list of references, which could have been reviewed by the investigators, but none of the authoritative citations were cited in the Document. He followed this comment with another on Jan.9, 2003, containing a short but important reference list, none of which were included in the Document.

8. Document: "Whether prenatal exposure to low doses of X rays are causally associated with childhood cancer is subject to controversy among researchers."  
Alice Stewart's groundbreaking in utero studies, carried on from 1956 until 1981, are widely accepted and have now been confirmed by Sir Richard Doll in 1997, a 40% increase in childhood cancers and leukemia before age 10, many from exposure to a single X ray.

It is essential that staff investigators give a careful reading to the numerous low dose studies before finalizing the document. As it now stands, the report is incomplete and minimizes the health risk from low-dose ionizing radiation.

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