

screening. This same phenomenon has appeared in the United States where screening has likely played a major role in the recent 20% decrease in breast cancer deaths over the last decade.

Unfortunately, by publishing an article that is full of dangerous nonsense, you have clearly followed the path of tabloid sensationalism for your paper rather than careful investigative reporting.

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Reply from Dr. Epstein:

Dear Editor,

I would like to commend Vitality for publishing a dissenting view on mammography, evoking Dr. Kopans' accusation of "tabloid sensationalism." At the risk of further provoking Dr. Kopans, may I comment on some of his questionable criticisms and assertions.

- Contrary to Dr. Kopans, mammography is highly profitable. Multibillion-dollar industries, including Siemens, DuPont, General Electric, Eastman Kodak, and Piker support and fund breast imaging programs and professionals. If all U.S. premenopausal women, about 20 million according to the Census Bureau, submitted to annual mammograms, minimal annual costs would be \$2.5 billion. These costs would increase to \$10 billion, about 5 percent of the \$200 billion 2001 Medicare budget, if all postmenopausal women were also screened annually; this is about 14 percent of the estimated Medicare spending on prescription drugs. Such costs will further increase some fourfold if the industry, enthusiastically supported by radiologists, succeeds in its efforts to replace film machines, costing about \$100,000 each, with the latest high-tech digital

machines; these were approved by the FDA in November 2000, costing about \$400,000 each. Screening mammography thus poses major threats to the financially strained Medicare system. Inflationary costs apart, there is no evidence of the greater effectiveness of digital than film mammography, as confirmed by a study reported at the November 2000 annual meeting of the Radiological Society of North America, of which Dr. Kopans may be aware. Digital mammography is also likely to result in the increased overdiagnosis of non-invasive cancer, ductal carcinoma-in-situ, which has about the same, about 1 percent mortality, whether diagnosed and treated early as late.

- In 1992 Congress passed the National Mammography Standards Quality Assurance Act. This requires FDA to ensure that screening centers review their results and performance, collect data on biopsy outcomes and match them with the original radiologist's interpretation of the films. However, screening centers still do not release these data as the Act does not require them to do so. It is essential that this information now be made fully public so that nationwide concerns on the reliability of mammography can be further evaluated. Dr. Kopans could be of great assistance in assuring such well overdue quality control.

- Dr. Kopans believes that radiation exposure from mammography is trivial and "may be ten times higher" than a chest X-ray. In fact, exposure from a chest X-ray is about 1/1,000 or one millirad of a rad (radiation-absorbed dose), while mean glandular dosage from one mammogram is about 300 millirads, narrowly focused on the breast rather than the entire chest. Thus, the common practice of taking two films for each breast results in some 600-fold greater radiation exposure than a chest X-ray. Thus, premenopausal women undergoing annual screening over a ten-year period are exposed to a cumulative total radiation dose of about 6 rads for each breast. Surely, Dr. Kopans would accept that

women are entitled to know just how much radiation they are exposed to during each mammography. Thermoluminescent radiation dosimetry (TLD), which measures entrance dose from which mean glandular dose can be simply calculated) has been well developed and available for about three decades. (Sources include the Medical Physics Laboratory, University of Wisconsin at Madison, Telephone 608-262-6320).

- As emphasized some three decades ago, by the prestigious Biological Effects of Ionizing Radiation committee of the National Academy of Sciences, each rad exposure increases breast cancer risk by about 1 percent, resulting in an approximate 6 percent increased risk over ten years of current premenopausal screening. It should be recognized that the track record of radiologists on indifference to the dangers of mammography is disconcerting. This is well exemplified by their enthusiastic participation in the 1970's Breast Cancer Detection Program, in which some 300,000 women received 2 to 3 rads exposure, and in some instances very much more, to each breast annually for over five years.

- As well documented, breast cancer risks from mammography are up to fourfold higher for the 1 to 2 percent of women who are silent carriers of the A-T (ataxia-telangiectasia) gene, and thus highly sensitive to the carcinogenic effects of radiation. By well-documented estimates, this accounts for up to 20,000 of the 205,000 breast cancers diagnosed in 2001.

- Breast self examination (BSE) is a safe, effective and very low cost alternative to mammography. That most breast cancers are first recognized by women themselves was admitted in 1985 by the ACS, an aggressive advocate of routine mammography for all women over the age of 40: "We must keep in mind the fact that at least 90 percent of the women who develop **breast carcinoma discover the tumors themselves.**" Furthermore, as well documented, "training increases reported breast self-examination frequency, confidence, and the number of small tumors found." A pooled analy-

sis of several 1993 studies showed that women who regularly performed BSE detected their cancers much earlier and with fewer positive nodes and smaller tumors than women failing to examine themselves. BSE would also enhance earlier detection of missed or interval cancers, especially in premenopausal women. There is a strong consensus that the effectiveness of BSE critically depends on careful training by skilled professionals, and that confidence in BSE is enhanced by annual clinical breast examination (CBE) by an experienced professional using structured individual training. The tactile sensitivity of BSE can be further increased by the use of Mammacare techniques to enhance lump detection skills, and by the use of FDA-approved and nonprescription thin and pliable lubricant-filled pads.

- The critical importance and reliability of BSE and CBE has been strikingly confirmed by the 2000 Canadian National Breast Cancer Screening Study. This reported the results of a unique individually randomized controlled trial on some 40,000 women, aged 50 to 59 on entry, followed by record linkage for nine to 13 years, with active follow-up of cancer patients for an additional three years. Half the women performed monthly BSE, following instruction by trained nurses, had annual CBEs by trained nurses or clinicians, and had annual mammograms, while the other half practiced BSE and had annual CBEs but no mammograms. It should be noted that the CBE performance by trained nurses was shown to be better than by clinicians. This finding is of particular interest in view of the growing perception that nurses are more sensitive than male clinicians to women's health issues. The results of this study also provided clear evidence on the reliability of CBE, in combination with BSE: "In women age 50-59 years, the addition of annual mammography screening to physical examination has no impact on breast cancer mortality." In other words, the mammographic detection of nonpalpable cancers failed to improve survival rates, as "the majority of the small cancers detected by mammography represent pseudo-disease or overdiag-

nosis." It should be further noted that the mammogram group had a three-fold increase in the number of false positives compared with the CBE and BSE group, resulting in unnecessary biopsies and surgery. In spite of such evidence, radiologists persist in their dismissiveness of CBE and BSE, particularly as "a substitute for screening practices that have a 'proven' benefit such as mammograms." This may also reflect bias by radiologists against encroachment on their own interests, apart from self-empowerment by women.

- The comparative cost of CBE and mammography in the Canadian Breast Cancer Screening Study was reported to be 1 to 3. However, this ratio is virtually meaningless as it ignores the very high costs of capital mammography items including buildings, equipment, and mobile vans, let alone the much greater hidden costs of overdiagnosis and unnecessary biopsies, specialized staff training, and programs for quality control and professional accreditation. This ratio would be even more favorable for CBE and BSE instruction if both were conducted by trained nurses. The excessive costs of mammography screening should be diverted away from industry and radiolo-

gists to research and aggressive public education on well-documented scientific evidence on avoidable causes of breast cancer. Of particular interest is the notable absence of any information on breast cancer prevention in the annual October Breast Cancer Awareness Month, promoted by the American College of Radiologists and American Cancer Society. Surely, the alarming escalation in the incidence of breast cancer from 1980 to 1999, 14 percent for premenopausal and 45 percent for postmenopausal women, more than merits at least as great priority on prevention as on damage control by screening.

For further details and documentation, I refer readers to my recent article "Dangers and Unreliability of Mammography: Breast Examination is a Safe, Effective and Practical Alternative," in the peer reviewed International Journal of Health Services, 31(3):605-615, 2001.

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