

'Scatter' Effects of Mammography Pose Little Risk

By Ed Susman, Contributing Writer, MedPage Today

Published: November 28, 2012

Reviewed by [Zalman S. Agus, MD](#); Emeritus Professor, Perelman School of Medicine at the University of Pennsylvania



Action Points

- This study was published as an abstract and presented at a conference. These data and conclusions should be considered to be preliminary until published in a peer-reviewed journal.
- This study was designed to quantify scatter radiation dose received by the thyroid gland, salivary gland, lens of eye, sternum, and uterus during screening digital mammography and found that scatter radiation from screening mammography is minimal, resulting in negligible risk to the patient.

CHICAGO -- Scatter radiation from screening mammography is minimal, even to the thyroid, and results in negligible risk to the patient, researchers reported here.

"We found that scatter radiation amounts to less than 2% of what a woman is exposed to in the natural environment," said Alison Chetlen, DO, from Pennsylvania State University Hershey Medical Center in Hershey.

For example, the exposure to the thyroid was 0.049 mGy in the study compared with an expected annual exposure from natural sources of 3.1 mGy, Chetlen and colleagues reported at the Radiological Society of North America annual meeting.

"The scatter dose to adjacent organs during screening mammography has a risk of cancer that is indistinguishable from the background incidence of cancer due to other sources," Chetlen said during an RSNA press briefing.

Chetlen's group recruited 207 women undergoing breast cancer screening with mammography. They attached optically stimulated luminescent dosimeters to the skin over the thyroid, at the bridge of the nose, the sternum, the umbilicus, and the submandibular gland. The women underwent two-view screening mammography.

Skin doses were then obtained. The authors also gathered other parameters including age, height, weight, body mass index (BMI), breast density, and breast compression thickness.

The average glandular dose and estimated skin dose were recorded. Scatter radiation dose to the thyroid gland, sternum, bridge of nose, right salivary gland, and umbilicus were plotted against BMI, breast density, and breast compression thickness.

They reported that the mean mGy dose of scatter radiation to the various organs was:

- 0.025 mGy to the bridge of the nose (a surrogate for the lens of the eye)
- 0.052 mGy to the right mandibular gland (a surrogate for salivary glands)
- 0.048 mGy to the right thyroid gland
- 0.049 mGy to the left thyroid gland
- 0.002 mGy to the umbilicus (a surrogate for the uterus)
- 0.874 mGy to the sternum

The authors pointed out that they expected the sternum to receive a higher dose because of its location.

Nonetheless, the scatter doses amounted to less than 4% of the radiation dose delivered to the breast in order to perform the mammography, Chetlen said.

She recommended against using a thyroid shield during mammography to reduce radiation scatter, pointing out that such collars may obscure the area near the top of the breasts and hamper the mammographic image.

Chetlen cautioned that radiation doses calculated in this study should not be considered an exact measure, "but rather a guideline to be considered by physicians concerned with mammography and scatter radiation levels."

"This study shows that background scatter radiation in screening mammography is negligible," said Gary Whitman, MD, from MD Anderson Cancer Center in Houston, who moderated the press briefing. "I do think this should be quite reassuring to patients."