GRAND CHALLENGE: DETECTING BREAST CANCER

Breast cancer is the second-leading cause of cancer death among women (Papas, 253). The American Cancer Society has indicated that mammography is the best early-detection tool available. It is able to detect cancer before – sometimes years before – physical symptoms are present (American Cancer Society, 13). It is recommend that women at or over the age of 40 have a mammogram annually (ACS, 13). Despite the fact that mammograms are the most effective early-detector of breast cancer, many women choose not to have them. Of all American women at or over the age of 40, only 54.9% have had a mammogram within the past year (ACS, 15).

One reason that women may not get an annual mammogram is pain. Mammography is quite painful for some women. In a summary of studies, between 0.2% and 62% of women reported some pain related to mammography. If the qualifier was changed from "pain" to "discomfort", 90% of women answered that they had experienced this (Papas, 254). There are other forms of early-detection, breast-self exam (BSE) and clinical breast-exams (CBE), but these are not as effective as mammography.

Is there a way to detect the presence of tumors that isn't as painful as mammography but more reliable and quantifiable than a BSE or CBE?
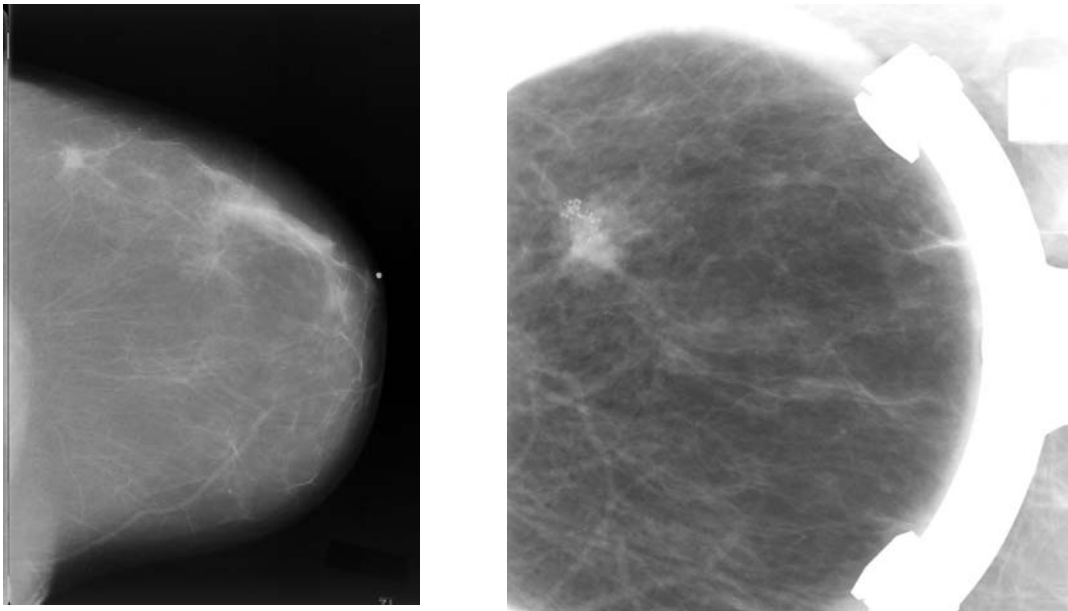

Figure 1: Mammogram images showing a speculated mass in the breast.
Images courtesy of Vanderbilt University Radiology Department.

Generate Ideas

Think over this question <u>ON YOUR OWN</u>. We won't share ideas with anyone (yet). Jot down your ideas about the following questions:

(1) In your own words, describe the need in society which the challenge question is identifying.

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(2) What are your initial ideas about how this need can be fulfilled?

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(3) What background knowledge do you think you need to answer the question?

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(4) What do you know about breast cancer and tumor detection already?

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