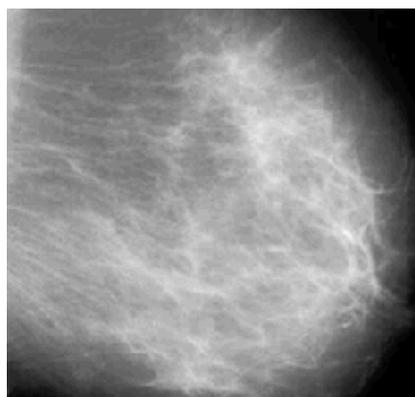


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**MAMMO-
GRAPHY**



RADIOLOGY: THE BASIC MODALITIES
Part Four: Conventional Mammography

How It Works. A mammogram is simply an x-ray image taken of each breast. The breasts are compressed while the x-ray is taken, to increase the radiologist’s ability to see abnormal masses. Mammograms expose the breasts to a relatively small amount of radiation, typically less than 20% of average yearly background radiation.

How the Images Are Made

The x-rays used to create mammograms are essentially the same as the ones to make an x-ray of the chest or hand; dense structures (like bone) appear as white, intermediate structures appear as gray, and less dense structures (like fat) appear as black. Low-energy x-rays are used to create mammograms, so that soft tissues (such as masses) are whiter and thus easier to see. Calcifications are a bright white, soft tissues (breast glands and masses) are a softer white, and breast fat is black.

When we search for a tumor on a mammogram, we are looking for a soft-tissue mass, which will appear white. This can be difficult to distinguish from normal glandular tissue, which also appears white – particularly in patients with “dense” breasts that contain a lot of glands (particularly Asian, younger, or smaller-breasted women).

Mammographers use the characteristics of a mass to determine whether it looks benign or malignant, and they give it a rating on the BI-RADS (Breast Imaging Reporting and Data System) scale (see below). An indirect sign of a malignant breast mass is a focal area of tiny calcifications, or microcalcifications, which the mammographer can see using magnifying glasses.



**COMMON
USES**

Mammography’s Most Common Uses

Screening Mammograms. A mammogram is the standard screening test for breast cancer today. A “screening” exam is a test used for routine check-ups, to make sure that presumably healthy people do not have a specific disease. Other examples of screening tests are colonoscopies to evaluate for colon cancer, or yearly blood tests to evaluate men for prostate cancer. These tests are performed on all people within a certain age group to evaluate for common diseases, so that they can be recognized and treated early.

Since breast cancer is relatively common, potentially deadly, and treatable, screening for this disease is very important. A screening mammogram consists of two standard views: craniocaudal (CC), in which the breast is compressed from top to bottom, and mediolateral oblique (MLO), in which the breast is compressed from side to side. Although mammograms often detect masses that are not cancerous and often miss small cancers, they are currently the best test that we have for screening women at low to average risk for cancer.

Diagnostic Mammograms. Once a mass is found on a screening mammogram, the patient will often return to have a diagnostic mammogram, which consists of specialized, close-up views of the mass with extra compression. This will help the mammographer better characterize the mass as either benign or malignant.

BI-RADS CLASSIFICATION SYSTEM¹

BI-RADS Category	Assessment	Recommendation(s)
0	Assessment incomplete	Need to review prior studies and/or complete additional imaging
1	Normal	Continue routine screening
2	Benign finding	Continue routine screening
3	Probably benign finding	Follow-up mammogram at six months
4	Suspicious abnormality	Perform biopsy, preferably needle biopsy
5	Highly suspicious of malignancy	Biopsy and treatment, as necessary.
6	Known biopsy-proven malignancy, treatment pending	Assure that treatment is completed

NEXT WEEK: MRI MAMMOGRAPHY

SOURCES

1. Eberl MM, Fox CH, Edge SB, et al. BI-RADS classification for management of abnormal mammograms. J Am Board Fam Med 2006;19:161-164.