Digital Mammography Artifacts and Clinical Applications
Advanced Health Education Center

Note To File

- For selenium detectors:
  - Lag is the carryover of signal from a previous image.
  - Ghosting is the reduction of sensitivity caused by previous exposure history of the detector

Ghosting
Caused when a latent image from a newly acquired image.
Recalibrate the detector to remove the memory of the previous image and check your detector temperature.

Breast-within-a-breast
Software processing artifact
Occurs in women with thick breasts
Rapid changes in breast thickness or tissue densities separating the central and peripheral regions of a thick breast may cause the software processing algorithm to create a false exaggerated boundary

Underexposure-the salt and pepper effect on the image

Thin breast artifact—seen on women that compress to less than 2cm—The large paddle edges may be included at the corners of the image. Not a malfunction and does not affect the diagnostic interpretation of the study—no correction required.

- Patient motion is the most common cause of blurring of images in digital mammography.
- Processing artifacts show up as dark halos around dense objects.
- Grid non-uniformities show up as areas of non-uniform brightness across the image and do not cause blurring.
Fix it!
• Use the shortest exposure time to reduce motion by:
  – Increasing compression
  – Increasing kVp

What is the best way to avoid patient related artifacts?
a. Careful positioning during the examination
b. Weekly cleaning of all surfaces
c. Checking images before completion of the e
d. Using surge protectors on all equipment

Which of the following is most consistent with a detector read-out error?
a.Vertically-oriented lines
b. Circular halos around the nipple
c. Grey shadow over half the image
d. Horizontal white band or bands

• Vertically oriented lines are rarely seen and are usually associated with detector calibration issues
• Circular halos around the nipple marker are created by the edge enhancement algorithm of the image processing software and are not caused by any readout error
• A grey shadow over half the image is a detector ghosting issue

A grid will be visible if which of the following parameters is set INCORRECTLY?
A. Grid composition
B. Grid ratio
C. Grid size
D. Grid speed

RCL as viewed on the radiologist workstation after being sent by the technologist from the acquisition workstation

At what stage in the imaging process did the error occur?
a. Storage
b. Readout
c. Processing
d. Acquisition
A dark halo surround a white metallic object on a digital mammogram is caused by which of the following technique factors?

a. Edge enhancement  
b. Too low kVp  
c. Display window and level  
d. Inadequate compression

A dark halo around an object such as a catheter port is caused by the edge enhancement algorithm used in image processing.

Too low kVp will cause underpenetration of the entire breast and give an image with high noise.

Display window and level can be set incorrectly and will cause the image to be too bright, too dark or have inadequate contrast.

Inadequate compression will lead to patient motion and a blurred image.