AbstractID: 14054 Title: Quantification of breast density using dual energy mammography: a post mortem study

Purpose: To investigate the feasibility of measuring breast density in *post mortem* breast samples with dual energy mammography.

Method and Materials: Twenty pairs of *post mortem* breast samples (n=40) were imaged with a dual energy mammography system. The system was equipped with a tungsten anode x-ray tube. Low energy images of each sample were acquired at a tube voltage of 28 kVp with a 50 µm rhodium beam filter at 60 mAs. High energy images of each sample were acquired at a tube voltage of 49 kVp with a 300 µm copper filter also at 60 mAs. Each sample was imaged at two different orientations. Half the samples were rotated about their horizontal axis and half the samples were manually reconfigured to simulate CC (craniocaudal) and MLO (mediolateral oblique) views. Scatter correction was performed on all images. Glandular and adipose material thickness maps were generated from each pair of dual energy images. The volume and breast density (glandular fraction) of each breast was calculated from the images of material thickness.

Results: The measurements of breast volume for the first (V_1) and second (V_2) orientation were related by $V_2 = 1.03\ V_1 - 6.2$ ($r^2 > 0.99$). The measurements of breast density for the first (D_1) and second (D_2) orientation were related by $D_2 = 0.97\ D_1 - 0.03$ ($r^2 > 0.97$). The correspondence of breast mass as calculated from dual energy mammograms (M_{DE}) to the mass of the sample as measured from a scale (M_S) was related by $M_{DE} = 1.01\ M_S - 8.10$ ($r^2 > 0.99$).

Conclusion: The results of *post mortem* studies were highly correlated and indicate that dual energy mammography is a repeatable measure of breast volume and breast density and a reliable measure of breast mass.

Conflict of Interest (only if applicable):