AbstractID: 9220 Title: Effect of Foam Pads on Mammography Dose Calculation

This study evaluates the effect of foam pads on mammography dose calculation. Indicated breast thickness as a function of compression force was measured for no pad, one pad, and two pads from 4 to 20 decanewtons at 2, 4, 6 and 8 centimeter (cm) breast thicknesses. Images were acquired using the mammography units AEC system using a tissue equivalent D-shaped phantom at 2, 4, 6 and 8 cm breast thicknesses. For each breast thickness, an image was acquired with no pad, with one pad (on the breast support plate), and with two pads (one on the compression paddle and one on the support plate). Technique factors were recorded and dose calculations were made using the method recommended by the ACR Mammography Quality Control Manual. For a 4.0 cm thick breast phantom compressed to 10 decanewtons with no pad, 1 pad, and 2 pads, the resulting indicated breast thicknessess were 3.5, 3.9, and 4.4 cm respectively. The no pad, 1 pad, and 2 pad dose calculations using the actual 4.0 cm thickness resulted in average glandular doses of 1.48, 1.57, and 1.59 mGy respectively, and using the indicated breast thicknesses of 3.5, 3.9, and 4.4 cm resulted in average glandular doses of 1.65, 1.60, and 1.47 mGy respectively. The results show that when using no foam pad the dose is overestimated by 11%, when using 1 pad dose is overestimated by 2%, and when using 2 pads dose is actually underestimated by 8%.