Purpose: To compare commonly clinically available methods of estimating skin dose for a Megavoltage Conebeam CT of the pelvis.

Methods: The clinical 6 MV conebeam uses 15 MU on a Siemens Oncor linac. Film tests using XV-2 film were done on a solid water phantom, as were tests using a parallel plate ion chamber at 2 mm depth. A Rando pelvic phantom was set up for a MVCB CT, and a cylindrically symmetric Isorad 6-12 MV PDM diode was placed at various angles around the phantom and irradiated using a 150 MU 6 MV arc beam with the same geometry as the clinical conebeam, giving higher and more accurate readings than would be obtained with the 15 MU conebeam. A comparison was made with the Pinnacle 8.0m treatment planning system. A strip of Optically Stimulated Luminescence dosimeters provides an accurate check of the surface dose distribution.

Results: All methods revealed an expected lateral asymmetry in the dose due to the starting and stopping angles of 270 (-90) and 110 for the conebeam. On the sides of the phantom, the diode dose was comparable to the Pinnacle-calculated dose at a depth of 3-5 mm. Near the anterior portion the diode dose was about 5% higher than the maximum Pinnacle-calculated dose at that angle. This difference is partly due to the increased diode response at shorter SSDs and higher dose rates, and to the geometry with the arc beam radiation being mainly anterior to posterior. The skin dose, corresponding to a depth of about 2 mm, is expected to be somewhat lower.

Conclusions: To estimate pelvic skin dose in the MV CB geometry, corrections for measurement depth and geometry can be used to improve the dosimetry for these common clinically available dosimeters.