

AbstractID: 5907 Title: How well do ctdi data obtained in a body phantom predict patient and embryo doses in abdominal ct?

Purpose: In this work, we compare central dose measurements in anthropomorphic phantoms with corresponding Computed Tomography Dose Index (CTDI) values obtained at the center of the body CTDI phantom.

Method and Materials: An adult Rando phantom was used to determine patient/fetal dose during an abdominal/pelvic CT examination acquired with clinically relevant techniques. TLD's were placed in multiple locations in the phantom to measure the dose in the abdomen/pelvis region. The corresponding $CTDI_{FDA}$ and $CTDI_{100}$ values were determined using an ionization chamber placed at the center of a 32 cm diameter acrylic dosimetry phantom.

Results: A pregnant patient, whose size is comparable to the Rando phantom, undergoing a CT examination on a commercial scanner receives an embryo dose of 16 mGy/100mAs, whereas published CTDI values for this scanner are *lower* by factor of 2.9 to 4.0. This large discrepancy can be accounted for by the following three factors: (a) specification of a tissue dose, as opposed to an air or acrylic dose; (b) use of a realistic phantom size; (c) inclusion of the total x-ray scatter in the tails of CT dose profiles.

Conclusion: To obtain accurate body patient doses from any specified body CTDI data, it is essential that soft tissue doses be obtained rather than air/acrylic doses, and with appropriate correction factors that account for the scan length and for the size of the patient.