

Purpose:

The goal of our research is to determine the viability of a Farmer ion chamber in verifying the reported CTDI_{vol} from CT scanners.

Methods:

We used a Siemens Somatom Sensation 16 slice scanner, three CTDI phantoms, a RadCal 100 mm pencil chamber (Model 10X6-3CT), a RadCal Farmer ion chamber (Model 10X6-0.6CT), and a RadCal Model 9015 control unit. Exposures were made with our routine adult chest protocol, for a 100 mm scan length of the phantom. Readings were made at the center and 12 o'clock positions.

Results:

We found the doses measured by the Farmer chamber to be greatly dependent on the pitch. Scans with a pitch < 1 are generally result in a larger CTDI_{vol} than what was reported by the scanner, while scans with a pitch > 1 are generally lower and give very inconsistent results. The dose rate is higher when $p > 1$, but the tube may not pass directly over the detector when at the 12 o'clock position. If the $p > 1$, an average of all the 3, 6, 9, and 12 clock positions should be made.

Conclusions:

The CTDI measurements with the Farmer chamber seem most accurate at a pitch less than 1 for longer scans. We plan expand the study of to other scanners with wider beams as well as more pitch values between 0.85 and 1.0.