AbstractID: 13126 Title: A direct skin dose calculation method in CT scans without table motion: Influence of patient size and beam collimation

**Purpose:** To calculate skin dose from console dose (CTDIvol) in CT scan modes without table motion, such as interventional and perfusion CT applications, and to investigate the influence of phantom size and beam collimation.

**Materials and Methods:** Skin doses were measured using a solid state detector placed on the anterior surface of six oblong water phantoms with measured lateral widths from 25 to 50 cm. Surface doses were measured using a sequential scan mode without table increment,  $12\times0.6$ mm collimation, 120kV, 80mAs and 0.5s rotation time on a 64-slice CT system. Console CTDIvol was recorded and the ratio between surface dose and console CTDIvol calculated for each phantom size. To investigate the dependence of this ratio on beam width, surface doses were measured at collimations of  $1\times5$ ,  $12\times0.6$ ,  $1\times10$ ,  $12\times1.2$ ,  $30\times0.6$  and  $24\times1.2$  mm using the 40cm phantom.

**Results:** The console CTDIvol for the  $12\times0.6$ mm collimation was 7.12 mGy, while measured surface doses were 4.23, 4.65, 4.24, 3.86, 3.55, and 3.47 mGy, respectively, for phantom size of 25, 30, 35, 40, 45 and 50 cm. The surface dose as a percentage of CTDIvol varied from 49% to 65%, increasing with decreasing phantom size except for the 25cm phantom. The measured surface doses (and percentage of CTDIvol) for the 40 cm phantom at different collimations were: 3.32 (68%), 3.77 (53%), 3.76 (78%), 4.23 (74%), 4.4 (74%), 4.79 (89%) mGy for collimations from 1×5 mm to 24×1.2 mm. **Conclusions:** For the same technical parameters (and CTDIvol), surface dose in CT scans without table increment varied with phantom size and beam collimation. For a given collimation and CTDIvol, surface dose in general increased with decreasing phantom size. For a given phantom size, surface dose and CTDIvol both depended on beam collimation, with surface dose as a percentage of CTDIvol generally increasing with beam width.