AbstractID: 6794 Title: The effect of user definable CT acquisition parameters on CT numbers for materials of various electron densities

Purpose
To investigate the effect of all user definable CT acquisition parameters on CT numbers for materials of various electron densities, and therefore patient dosimetry.

Methods & Materials
CT scanners come supplied with a large number of user definable parameters whose effects on CT numbers are not well documented. An electron density phantom (Gammex RMI 467), with 16 inserts, having 13 densities ranging from 0.28-1.69 g/cm^3, was scanned using: helical and axial techniques; 3 kVp settings; 6 reconstruction filter types; 8 mAs settings; 4 different slice thicknesses; and 4 different field of view diameters. In our study we have utilize phantom with 16 inserts. A total of 77 scans were acquired.

Results
The most significant variation in CT numbers resulted from the change in kVp settings. CT number variation progressively increases for inserts with density of 1.00 g/cm^3 and higher. Standard deviation in CT numbers for 1.69 g/cm^3 insert was 8%. However, in a case when kVp held constant adjusting other acquisition parameters (filters, mAs, slice thickness, field of view, technique) resulted in a standard deviation of no more then 3% for all 13 densities.

Conclusions
The kVp settings has a most significant effect on CT numbers whereas change in mAs, reconstruction filter type, slice thickness and field of view diameter result in only minor variations. The dosimetric effect for pediatric cases, typically acquired at 90kVp, will be presented.