Purpose:
To compute ICRP-103 based gender and age specific (baby, child, adult) normalized effective dose conversion k-factors (mSv/mGy*cm) for clinically relevant CT scanned body regions.

Methods:
We used the program CTExpo-v2.0 to compute DLP-to-effective dose k-factors for the scan ranges used clinically for examinations of the head, orbits/temporal bones, maxillofacial, head/neck, neck, chest, abdomen, chest/abdomen, chest/abdomen aorta, pelvis, abdomen/pelvis, chest/abdomen/pelvis, and chest/abdomen/pelvis aorta. The mathematical models of "baby", "child", "EVA", and "ADAM" were used with the current ICRP-103 tissue weighting factors as well as the previous ICRP-60 weighting factors. We used three CT scanner models, one from each of the most popular manufacturers, with 20-mm total beam collimation and helical pitch of 1.

Results:
Except for the head, the k-factors for the adult male are lower than the female by up to ~33% (chest). For the head, the k-factor for the adult male model is ~10% higher than the female. The maximum ICRP-103 to ICRP-60 based k-factor ratio is ~1.35 for “baby” head, and the minimum is ~0.6 for “baby” pelvis. We compared our ICRP-103 based k-factor estimates for adult models with the similar, but hermaphrodite model estimates of Huda et al. (Medical Physics, March 2011.) The largest difference (40 - 46%) was observed for the female abdomen scan range. For the female chest, our estimates are 17 – 21% higher than the ones of Huda et al. For the male chest, our estimates are 19 – 23% lower. For the male chest/abdomen/pelvis our estimates are 14 – 18% lower.

Conclusions:
The k-factors for adult and female models differed by as much as 33%. ICRP-based k-factors differed from ICRP-60 based k-factors by as much as +35% to -40%. Finally, some significant differences were observed for certain gender specific scan ranges between the present work and that of Huda et al.