Reviewer's report

Title: Radiation Dose Reduction at a Price: the Effectiveness of a Pediatric Male Gonadal Shield During Helical CT Scans

Version: 2 Date: 15 February 2007

Reviewer: Dianna D Cody

Reviewer's report:

1. Is the question posed by the authors new and well defined?
   OK.

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work?
   No methods were provided regarding the evaluation of image quality.

3. Are the data sound and well controlled?
   Data appears reasonable.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   OK.

5. Are the discussion and conclusions well balanced and adequately supported by the data?
   The conclusion in the abstract is rather lame and basically reflects common sense in CT. Something with higher impact should be stated instead.

6. Do the title and abstract accurately convey what has been found?
   The title implies that this work was done for pediatric patients and with pediatric techniques. Neither is true. An adult phantom and adult technique factors were used throughout. This would be relevant to large teenager patients of the same size as adults. I suggest that the term “Pediatric” be removed from the title.

7. Is the writing acceptable?
   It is acceptable.

Specific edits:
I would consider all the edits outlined below to be mandatory. Some would be considered major, some minor. This manuscript warrants publication AFTER ALL of these comments have been thoroughly addressed.

The new proposed tissue weighting factor for gonads is 0.08 in place of 0.20; this change should be mentioned in light of the impact of this project.

Methods: The chamber (and phantom) appear to be pretty far away from iso-center (2 cm perhaps). This should be acknowledged, and any expected impact it might have on the measurements and image quality should be discussed. It would be fairly quick and easy to repeat a single measurement with the phantom and chamber properly centered to verify that the values reported are accurate to within a reasonable percent. Although the point of the manuscript is the relative reduction in dose using these shields, others will desire to use the values for gonad dose in absolute terms, and this should be tempered by acknowledging the impact of poor phantom positioning.

This previous comment was not addressed in the current version of the manuscript:
Figure 5 - The use of a display field of view that is too small for the anatomy scanned in combination with the set up being off-center may have increased the intensity of the artifacts shown. Can the artifact evaluation scan please be repeated with a more appropriate set up? If this is not feasible, please acknowledge that the artifacts may have been accidentally emphasized due to this choice of DFOV.

The description of the previous papers describing poor use of shields should include the fact that all were limited to radiography and are not directly relevant to CT.
A recent publication that suggests adjusting technique instead of using shields to reduce radiation dose would be a good addition to this manuscript, and should be added to the discussion. See: Geleijns J, et al. Eur Radiol 16:2334-2340, 2006.