Author’s response to reviews

Title: Supplementary Addendum to "Radiation dose of digital radiography (DR) versus microdose x-ray (EOS) on patients with adolescent idiopathic scoliosis: 2016 SOSORT-IRSSD "John Sevastic Award" Winner in Imaging Research."

Authors:

Steve Hui (stevehui@cuhk.edu.hk)
Winnie Chu (winniechu@cuhk.edu.hk)

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Author’s response to reviews:

Reviewer reports:

Reviewer #1: Abstract not very helpful to understanding the nature of the changes made to the original manuscript: What kind of details were added and why? What was the additional parameter included/not included in the simulation?

Reply: Thank you for the comments. The abstract has been revised to provide more details on the specific parameter suggested to be included in the simulation (line 19-22).

Suggested rewording:

From:

"The simulation of effective dose in this article was solely based on using parameters provided in table 2 of the manuscript which only a 0.1mm copper filter was included and the inherent 1.5mm aluminum filter was omitted. We would like to suggest other readers to consider using both filters in the simulation to collect results that would best reflect the real circumstance if they were planning to conduct a similar study…. We have verified that with the addition of the aluminum filter, the average effective dose from micro dose protocol would be increased from 2.6μSv to 3.1μSv similar to the results conducted by Dr. Pedersen and colleagues."

To:

The simulation of effective dose in this article was solely based on using parameters provided in table 2 of the manuscript which included only a 0.1mm copper filter; the inherent 1.5mm aluminum filter was omitted. We have verified that with the addition of the aluminum filter, the
average effective dose from the micro dose protocol would be increased from 2.6μSv to 3.1μSv similar to the results obtained by Dr. Pedersen and colleagues. We suggest using both filters in simulations to determine results that best reflect real circumstance if other investigators plan to conduct similar studies."

Reply:

Thank you very much for the correction. The manuscript has been revised as suggested (see main text).

Reviewer #2: This is a useful addendum to the published paper, as it provides a value for effective dose that probably more likely corresponds to the clinical use of spinal radiography.

Some parts of the present addendum are unclear or incomplete. The following clarifications are recommended.

At some point in the main text it would be helpful to readers of Scoliosis and Spinal Disorders to note that filtration using copper and/or aluminum alters the energy spectrum of the x-ray beam, and this in turn alters tissue absorption and hence effective x-ray dose. (If I understand this issue correctly).

Reply: Thank you for the suggestion. It has been added into the manuscript (line 32-34).

Line 17: "simulation of the effective dose" -> "dose calculated by simulation using PCXMC 2.0" (consistent with text in the original article Hui et al. 2016). Similarly line 29: "simulation of effective dose" -> "dose calculated by simulation using PCXMC 2.0"

Reply: Thank you for the suggestion. They have been revised in the manuscript (line 16-17, 34-35).

Line 19: "one additional parameter" - specify "including more realistic representation of x-ray filtration" or similar.

Reply: Please see revised abstract (line 19-22).

Line 30: "the manuscript" -> "Hui et al. 2016"
Reply: Thank you for the correction. Please see revised manuscript (line 36 and 40).

Line 31. Apparently they recalculated effective dose for the EOS system only, after including dual filtration. If so, this should be specified here in the text.

Reply: Please see revised manuscript (line 41).

Also, lines 36/37: "We have verified that with the addition of the aluminum filter…." -> "We recalculated effective dose with the additional (aluminum) filtration and this showed that the average effective dose for the EOS micro-dose protocol…”

Reply: Thank you for the suggestion. It has been corrected in the manuscript (line 37).

Line 38: specify that 2.6 corresponds to the value given for EOS Effective Dose (μSv) in Table 3 of Hui et al. 2016

Reply: Thank you for the comment. Additional content has been added in the manuscript (line 39-40).

Line 39: "Dr. Pedersen and colleagues" give a reference to these findings (if published) - otherwise cite as 'personal communication' or similar. (I could not find a corresponding publication via Medline search).

Reply: Thank you for the suggestion. It has been cited as ‘personal communication’. Please see revised manuscript (line 41-42).

Line 49 "be" -> "been".

Reply: Thank you for the correction. It has been revised in the manuscript (line 54).

Line 52: "the article" -> "Hui et al. 2016"

Reply: Thank you for the correction. It has been revised in the manuscript (line 57-58).

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