ATOM INDONESIA
Author's Responses

Article : #425

Name of All Authors :

Article Title : The evaluation of the effective diameter (D_{eff}) calculation and its impact on the size-specific dose estimate (SSDE)

E-mail :

Line #	Referee's Comments	Author's Responses
12	"…….accurate….. ", it is better omitted.	Thank you very much for your nice corrections. We have omitted this word as suggested.
19	"produces high radiation dose to the patient" it might be better "delivers higher radiation dose to the patient in comparison to other imaging modalities"	We have changed the sentence accordingly. Line 21-23.
20-39	Without illustration of numerical risk, this statement is frightening. It seems CT is very dangerous, while in fact CT is *golden standard in medical imaging*, and the benefit for the patient is much prominent. Furthermore the incidence rate is 24% higher than the rate in the unexposed group, what is this numerical rate in the unexposed group (per year?). This introduction should be revised in order to give balanced information. Please see the additional information below this Table.	We have changed the introduction to give balanced information. Please see the revised manuscript. Line 24-52.
40	…..accurately...is better omitted.	We have omitted this word as suggested. Line 53.
41	…evaluate patient risk and…is better omitted. To optimize protocol is to get a good quality image with the lower achievable dose, that means lower the risk.	We have omitted the sentence "evaluate patient risk and" as suggested. Line 54.
42-43	……and evaluating radiation risk… it is better maybe change with radiation dose to patient	We have changed the word "radiation risk" into "radiation dose to patient" as suggested. Line 55-56.
49-50	……and risk estimation….. is better omitted	We have omitted this sentence as suggested. Line 63-64.
64	For accurate…..better add "more" to become "For more accurate….."	We have changed accordingly. Line 78.
172	"…., type……..so on." It will be better to change into "….., and type of filter."	We have changed accordingly. Line 186.
200	There is no Figure 3, do you mean Figure 2?	Yes, We do. Thank you very much. We have changed it into Figure 2. Line 215.
223-224	……TCM is not activated. Is this indicated at the console? Maybe it is activated	We did not check on the console. However, we have extracted and viewed the tube

	automatically, but because the head sizes of all patients are not significantly different all of the $CTDI_{vol}$ values are almost constant.	current for every slice from DICOM header and its value was constant. Previous study stated that TCM is used routinely for chest, abdomen, and pelvis CT studies, but is often not used for routine head CT exams. However, the use of TCM for head exam will potentially reduce the CT dose ($CTDI_{vol}$) (Angel and Zhang, Med Phys, 2012; 39(6): 3925). Line 245-250.
Line #	**Editor's Comments**	**Author's Responses**
21-26	What the linkage of "estimation atomic bomb survivors in Japan with risk from CT radiation"? It would be better to refer the previous study the risk from CT radiation to the cancer.	We have changed. Plese se the new manuscript. Line 42-45.
16-37	The flow of sentence would be nice if you can rewrite : Ct-examination – previous study radiation risk of CT – proposal to reduce the dose	We have changed it. Please see the revised manuscript. Line 21-52.
42-49	The sentence is too long, it would be great if you can simplify or break into two sentences	It has divided into two sentences. Line 55-63.
57-58	Please rewrite the sentence "size of the patient decreases the radiation dose increases"	We have changed. Please see the manuscript. Line 69-70.
115	What the definition of A?	A is the cross-sectional area of the patient. Please see the revised manuscript. Line 128.
145	Is the methods automatic contouring originally proposed by the author?	Yes, the methods of automatic contouring originally proposed by the authors, and it has been published in Adv. Sci. Eng. Med. **7** (2015) 892. (http://dx.doi.org/10.1166/asem.2015.1780)
192	P notation should be italic	We have changed accordingly. Line 207.
202-204	Please make clear why the CTDI for head examination is constant? Do you have any references or previous study works support this statement?	TCM is used routinely for chest, abdomen, and pelvis CT studies, but is often not used for routine head CT exams. There was no necessity for modulation of the tube current in the head since attenuation was approximately the same for all projection angles. However, many studies used TCM for head exam and reported that TCM had reduced CT dose (Angel and Zhang, Med Phys, 2012; 39(6): 3925 and Wang et al, 2012, 262(1): 191-8). Please see the revised manuscript, we have added an explanation and reference at the end of paragraph. Line 245-250.
209-213	Do you have any references who have the same statement with this sentence?	Many papers stated the same statement. One of them are Angel et al, Monte Carlo

		simulations to assess the effects of tube current modulation on breast dose for multi-detector CT, Phys Med Biol. 2009; 54(3): 497–512. doi:10.1088/0031-9155/54/3/003.
239-244	Which parameters in the text represent the geometrical of ellipsoidal or circular?	The effective diameter was directly calculated from the cross-sectional area of the patient (A): $D_{eff,A} = 2\sqrt{\frac{A}{\pi}}$ With the assumption that the geometry of patient is in circular or elliptical shape, the area of cross-section patient is: $A = \pi\ r_1\ r_2$ $r_1 = \frac{LAT}{2}$ $r_2 = \frac{AP}{2}$ So, D_{eff} will be: $D_{eff} = \sqrt{AP\ x\ LAT}$ If the geometry of patient is in circular or elliptical shape, $D_{eff}=D_{eff,A}$. And if the D_{eff} becoming more different from $D_{eff,A}$, the patient geometry is getting further from circular or elliptical. This is also stated by AAPM in the report No 204 [10].
251-252	Is it the general conclusion that head examination is not statistically significant for Deff,c and Deff,A in other author ? Is it conclusion found only based on your data?	This is our conclusion, based on our data of the current study. So far, we have not found a study on this issue yet.
268-272	Is it the notation Deff is true? or it should be SSDE ? if it is SSDE, please check the p-value between the text and Table 3	There is no standard notation of effective diameter. Noferini et al used EFD for effective diameter (Noferini et al, Radiol Phys Technol, 2014; 7:296–302). McMillan et al used ED for effective diameter (McMillan et al, Med Phys, 2014; 41 (12): 121909). Pourjabbar et al used D_{Eff} for effective diameter (Pourjabbar et al, World J Radiol, 2014; 6(5): 210-217). In another our publication, we used D_{eff} (Anam et al, Australas Phys Eng Sci Med, 2016;1-6. DOI: 10.1007/s13246-016-0497-z). In the current study, we used D_{eff}. See the revised manuscript.
298-299	The statement is true for	We do not understand the meaning of an uncomplete sentence.
326-331	In the conclusion : It would be great if you added the impact of diameter effective to SSDE has to be mentioned to match with title	Thank you very much. We have added the conclusion. Please see the revised manuscript. Line 352-356.

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Author Signature(s) Date

Name(s) (print)