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Letter to Editor

Accuracy of dose calculation algorithms in Eclipse treatment planning system: An update

Dear Editor,

Recently, I read an excellent article entitled "*Dose prediction accuracy of anisotropic analytical algorithm and pencil beam convolution algorithm beyond high density heterogeneity interface*"[1] published in South Asian Journal of Cancer. In that study, Rana *et al.*,[1] concluded that the anisotropic analytical algorithm (AAA) is more accurate than the pencil beam convolution (PBC) algorithm for dose calculations in external beam radiation therapy. This information can serve as one of the factors that can help in selecting AAA vs. PBC for dose calculations in the Eclipse treatment planning system (TPS). While results from Rana *et al.,* are accurate comparing AAA with PBC, I would like to point out that Eclipse TPS has recently implemented new generation dose calculation algorithm called Acuros XB. Since Acuros XB, a Monte Carlo based algorithm, is now widely available for dose calculations, several researchers[2-5] have investigated the dose prediction accuracy of Acuros XB, and compared the results of Acuros XB with that of AAA measurements, and Monte Carlo simulations. The studies involving Acuros XB showed that Acuros XB is superior to AAA when dose calculations are performed in the presence of heterogeneities. For instance, Bush *et al.,*[3] showed that, in comparison to the Monte Carlo results, Acuros XB had up to 4.5% difference, whereas AAA results had differences up to 10.2% in lung and up to 17.5% in low-density lung. Similarly, Rana *et al.,*[4] showed the difference between Acuros XB and measurement results was up to 3.8%, whereas AAA had a larger deviation from the measurement, with difference up to 10.9% beyond the air gap.

Although AAA has been a preferred option over PBC in Eclipse users for the past few years,[1,6] it must be noted that Acuros XB is more accurate to use for dose calculations in the Eclipse TPS.[2-5] Furthermore, the accuracy of dose calculation in radiation therapy is particularly important to avoid the dose underestimation or overestimation. It is recommended that Eclipse users explore an option to calculate the cancer treatment plans using Acuros XB instead of AAA or PBC if Acuros XB is available in their TPS.

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