

AbstractID: 13028 Title: Validation of experimental results in small field dosimetry

Purpose:

During the implementation of Radiosurgery in clinical routine it is important to use as many detectors as possible since small field dosimetry is not a very easy task due to the lack of lateral equilibrium. In order to validate the experimental results obtained during the implementation of stereotactic Radiosurgery fields, a comparison was performed with the theoretical data published in the literature.

Method and Materials:

The first theoretical approximation proposed by Sauer et al which calculates the beam quality parameter (Q) and the tissue-phantom ratios (TPR), for any field size. The $TPR_{20,10}$ used in this investigation was derived from measurements taken from a linear accelerator of 6 MV photons (Varian 6EX) by using different detectors: a pin point ion chamber (CC01); a small ion chamber (CC13); a stereotactic diode from Scanditronix/Wellhöfer.

Results:

The comparison of experimental results obtained in this investigation by comparing with Sauer et al values show -1,8%, 4,0% and 4,9% for the pin point chamber, the CC13 ion chamber and stereotactic diode respectively. Regarding the BJR-25 published data one can consider the results provided by a Farmer type chamber which were more common at that time. On the other hand, the zero-field approximation (Cheng et al) gives a small difference of 0,7% since only the stereotactic diode has been considered in both investigations. By comparing the experimental results with those provided by Cho et al, a much better agreement is found except for the pin point chamber. Further investigations will be made with this late detector in order to clarify all possible deviations.

Conclusion:

The comparison of experimental results with pin point chamber, small ion chamber and stereotactic diode shows good agreement with literature data, thus providing an appropriate method for validation of experimental results for small field dosimetry.