

AbstractID: 8272 Title: The prediction of Output factor of range modulated bragg peak using patient and beam data

Purpose:

In proton therapy, the patient quality assurance (QA) is performed by measuring the beam range, spread-out bragg peak (SOBP) and the output factor. There is a method to get the output factor without patient QA procedure but predicted output factor from other patient's QA data. The purpose of this study is that we estimate the output factor prediction conformity and study the method which has no statistical limitation of patient QA data.

Method and Materials:

To evaluate the prediction conformity, We compare the predicted output factor which is came from the function of $r = (\text{Range-SOBP})/\text{SOBP}$, with measured output factor by patient QA. The parameters of the output factor function are calculated by fitting 2-dimensional graph which is consisted of r and output factor. This study is base on 100 patients QA data at National Cancer Center (NCC) in Korea. In addition, we tried to find another method of output factor expectation by measuring 10 points of data set at each options. This method will be from statistical limitation of patient data.

Results:

The output prediction from patient QA data shows less than 2% of discrepancy. The output prediction using beam data set provides good agreement as less than 2% of discrepancy from real measurement.

Conclusion:

The beam data based output prediction is well matched with measurement as patient data based prediction which has statistical limitation.

Conflict of Interest (only if applicable):