

Convenient Morning QA of LINAC using Step Wedge

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INTRODUCTION

Recently, a digital equipment can make a special applications (e.g. image) and expand their utility. This powerful tool is already invaded for a good dosimetry devices in Radiotherapy. Accurate dose delivery is important to treat for patient. Many institutes have inherent dosimetry protocols and different detectors that measure by reading of amount of radiation. In this experiment, we research not only for convenient set up of morning QA but also to ensure determining of limited error for accept. The use an Electronic Portal Imaging Device (EPID) for relative transmission dose is acceptable range.

METHOD

For getting digital value conversion from reading that the numerical value is indicated transmit flux of photons by Electronic Portal Imaging Device (Portal Vision, Varian), compare with ionization chamber. Two reading is analyzed for response data that investigate from EPID reading to water's PDD.

In these devices, the relation between dose rate D and image pixel value I is given by

$$I = G(D) = a \cdot \overline{D}^{1/2} + b \cdot \overline{D}$$

The values of a and b are different for each EPID and each treatment machine, since they depend slightly on the dimensions and type of material of the EPID, the connection cable and beam energy*.

RESULTS

Most commercial radiation detectors used in our study, pixel value is converted to PDD. After get a detector response curve, read the pointed pixel value and it recalculated to absorbed dose. Quite a few variance in output consistency of LINAC, less than 1.2%, is acceptable range for treatment.

EPID dose coincide with water and daily variance is within 0.5%. But a certain depth differ to pre-handled data. Because beam attenuator is lead, shallow depth is not convert perfectly. Nevertheless EPID is a convenient beam checker.

DISCUSSION

The role of EPIDs is provide image information about irradiation geometry and its reproducibility day-to-day*. Among them, this paper struggles with reproducibility. But wide bound of beam attenuator can cause incorrect results.

CONCLUSION

EPID is useful for beam checker at morning QA. This is a tiny effect of digital image making.

In regular QA of LINAC, reference depth is selected for accurate analysis of absorbed dose in

every high energy beam. And their coincidence can do more particular work.