EPIbeam Webinar (7-29-2020)

# DOSIsoft

DOSIsoft serves both RO and NM. For RO, they provide TPS and patient QA solutions. For NM, they provide molecular RT tools.

DOSIsoft offers a patient QA solution consisting of three tools:

* MU2net does secondary MU calculation. We are not in the market for this because we have Mobius.
* EPIbeam does 2D pretreatment beam verification.
* EPIgray does 3D in vivo dosimetry.

DOSIsoft also offers PlanIt, a tool for brachytherapy dosimetry for brachy. They will soon release an I-131 module.

# EPIbeam

EPIbeam provides EPID-based, phantomless patient QA. It uses two dose metrics—the prediction model and the conversion model. The prediction model calculates 2D dose-to-water using the RT plan (this is not a hybrid plan). The conversion model calculates 2D dose-to-water at zero using an EPID open portal image. The prediction and conversion models are compared via gamma analysis.

EPIbeam is browser based and vendor agnostic. The interface provides a to-do list (similar to SNC Routine’s) and a multi-criteria outcome dashboard. Users create their own protocols that specify gamma thresholds, whether or not EPID re-centering should be performed automatically, etc.

The report generated by EPIbeam provides the percent pass rate, EPID shift (if automatic shift is enabled). A “more details” dashboard displays the predicted and acquired images as well as difference profiles of raw difference and gamma. When viewing the report, you can change parameters.

# EPIgray

EPIgray uses the patient RT plan, RT dose, RT structures, and CT from the TPS, and the logs and acquired EPID image from the linac. The EPID image is used to backpropagate the dose to the patient.

There are two EPIgray interfaces. EPIgray Web is browser based. EPIgray Expert is a stand-alone application. EPIgray Web provides basic analysis, including for individual fractions and plots of trends over multiple fractions.

EPIgray Expert provides 3D in-situ display of dose difference, scatter plot, and DVH analysis.

The algorithm used to reconstruct the 3D dose to each organ is as follows. The EPID image is converted to an IBM (I think I misheard this…) image, which is used to calculate dose to water at the height of the EPID panel. The findHTMR function converts this to dose in patient.

# Evaluation

Zach thinks that EPIgray would be a great tool for us to detect positioning errors, especially because we only do MV imaging (and CBCT for IMRT cases).