A method for validating complex radiation treatments using 3D dosimetry that can be implemented remotely

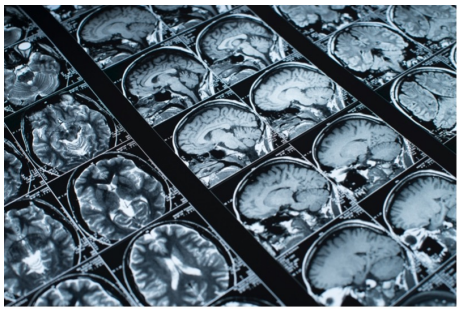
Unmet Need

Radiation therapy is an essential element of cancer treatment that has been estimated to be potentially beneficial to 4 million diagnosed patients every year. The advent of commercially available magnetic resonance imaging guided radiotherapy (MRgRT) systems offers exciting new capabilities for improving patient treatment through real-time, image-guided radiation therapy. However, the permanent magnetic field in MRgRT systems introduces yet another source of uncertainty in the prediction of dose distributions—an already error-prone process. Verifying radiation dosimetry is essential in every treatment plan, and it's of particular importance for new complex therapies. There's a concern that the standard 2D measurements used may have unrevealed systematic errors or discrepancies. There is a need for methods that offer a more comprehensive validation of complex radiation therapies.

Technology

Duke inventors have reported a method for validating the accuracy of advanced and complex radiation treatments, including MRgRT. Specifically, this is a hybrid approach that uses 3D measurements and Monte Carlo calculations to account for temporal and spatially dependent behaviors observed in PRESAGE® dosimeters between irradiation and readout. This technology has been demonstrated using PRESAGE® dosimeters to validate the dosimetric accuracy of a commercially available MRgRT system from ViewRay. It has also been developed for validating off-site MRgRT systems with high resolution.

Advantages



Duke File (IDF) Number

IDF #:T-004878

Patent Information

Patent #: 10,617,892
Patent Title: METHODS FOR GENERATING ACCURATE RADIATION DOSE MAPS CORRECTED FOR TEMPORAL AND SPATIAL CHANGES ARISING IN REMOTE DOSIMETRY APPLICATIONS
Country United States of America

Meet the Inventors

Oldham, Mark
Mein, Stewart Biedeman

Contact For More Info

Koi, Bethany
919-681-7552
bethany.koi@duke.edu

Department

Radiation Oncology

Publication(s)

•••

External Link(s)

• From the lab of Dr. Mark Oldham

- De-risks the implementation of complex radiation therapy technologies like MR-IGT compared to standard 2D measurements
- Has been demonstrated with a commercially available MRgRT system
- Developed for off-site validation to make it accessible to hospitals that don’t have access to the optical scanners required for 3D dosimetry