

NOVEL SOFTWARE TO INCREASE THE ACCURACY OF PROTON THERAPY

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Technology Description

Developed by researchers in the Williamson and O'Sullivan Labs at the Washington University in St. Louis, this technology is a novel software platform that creates more accurate proton beam targeting to tumors. The software is used during proton therapy treatment planning and allows more of the radiation to be delivered directly to the tumors and so a smaller safety margin of normal tissue is needed. A higher percentage of the radiation being targeted to the tumor may lead to better cure rates and disease-free intervals. Sparing more normal tissue may lead to safe treatments, fewer side effects, and better patient quality of life. More accurately targeting the proton beam is especially important for vulnerable pediatric patients, as well as those cancers with sensitive structures, such as the gastrointestinal tract, close to the tumor site such as prostate. The technology may also be useful in treatment planning for other types of radiation therapy, including brachytherapy.

Stage of Development

The software has been tested and validated with tissue phantoms.

Potential Applications

- Proton therapy treatment planning
- Radiation therapy treatment planning
- Brachytherapy therapy treatment planning

Key Advantages

- More accurate – reduces the margin of error from 3% to <1%
- More effective – more accurate proton beam targeting means the tumor receives more of the radiation dose
- Safer – smaller margins mean less normal tissue is irradiated
- Better outcomes – less irradiation of normal tissue leads to fewer side effects and a better quality of life for patients. Higher irradiation of tumors may lead to higher levels of cures or longer disease-free intervals

Links:

- [*Predicting Material Composition and Density From Basis-Vector Model Weights for Dual-Energy CT-Based Monte Carlo Proton-Beam Dose Calculations*](#) Presentation from AAPM 2022 July 2022