A more realistic training kit for medical students and fellows to master brachytherapy procedures

Unmet Need

Despite the potential for fewer side effects and shortened treatment times associated with brachytherapy, brachytherapy utilization has been declining over the years. The decline has been linked to a variety of factors, including a lack of training opportunities. A 2019 survey sent to residents in the Association of Residents in Radiation Oncology showed that confidence in starting a brachytherapy practice had a rate of 54%, compared to a rate of 97% in SBRT/SRS procedures. The survey also presented a statistically significant relationship between increased number of brachytherapy cases performed and an increase in confidence rates for starting a brachytherapy practice after residency. However, the existing training options are expensive, not representative of true anatomical material, and do not allow trainees to comprehensively consider the various encountered in human anatomy. There is an ongoing need for improved methods of brachytherapy training that increase confidence of the trainees to improve the radiation oncology outcomes for patients.

Technology

Duke inventors have reported a training kit intended to assist medical students and fellows during brachytherapy training. This is a modular, multi-material, pelvic phantom kit used to train radiation oncology residents on high dose rate brachytherapy training. The multi-material printing is used to represent different interchangeable organ anatomies. The kit is designed using patient anatomy data obtained from CT and MRI scans to generate a three-dimensional model. The model is adjusted and refined, depending on

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Publication(s)

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External Link(s)

• A Duke Co-Lab Innovation Grant project

desired features, and 3D printed to create the training kit. A prototype of the technology has been developed.

Advantages

- Offers the only modular, multi-material pelvic training phantom for brachytherapy, which in turn creates a more realistic training tool
- 3D printed anatomical components that allow for rapid, affordable prototyping that can be made patient-specific
- Unlike other anatomical models used in surgical education, designed specifically for brachytherapy practice