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Advancements in radiation therapy techniques for the treatment of breast cancer

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Breast cancer is the most common cancer among women worldwide, and radiation therapy plays a crucial role in its treatment. In recent years, there have been significant advancements in radiation therapy techniques for the treatment of breast cancer, which have led to better outcomes for patients. This presentation will discuss the latest developments in radiation therapy techniques for breast cancer treatment, including intensity-modulated radiation therapy (IMRT), volumetric modulated arc therapy (VMAT), and proton therapy.

IMRT is a highly precise form of radiation therapy that allows for the delivery of high doses of radiation to the tumor while sparing healthy tissue. VMAT is a newer technique that delivers radiation in a single rotation of the treatment machine, resulting in faster treatment times and improved patient comfort. Proton therapy, a type of particle therapy, delivers radiation in a highly targeted manner, reducing radiation exposure to healthy tissues and minimizing side effects.

In addition to discussing these new techniques, the presentation will also cover the clinical outcomes and patient benefits associated with each modality. The role of medical physics in optimizing treatment planning and delivery will also be highlighted. The advancements in radiation therapy techniques for the treatment of breast cancer are helping to improve patient outcomes and quality of life, and medical physicists are at the forefront of these developments.

Recent publications

- 1. Krstic, D., Nikezic, D., Jeremic, M. Z., Dolicanin, E., Miladinovic, T. B., & Zivkovic, M. (2023) Comparison between MCNP and planning system in brachytherapy of cervical cancer. Appl Radiat Isot, 192, 110614.
- Yu, Kwan Ngok; Watabe, Hiroshi; Zivkovic, Milena et al. (2023) DynamicMC: An Open-source GUI Program Coupled with MCNP for Modeling Relative Dynamic Movement of Radioactive Source and ORNL Phantom in a 3- dimensional Radiation Field. Health Physics 124(4):p 301-309.
- Živković, M., Beni, M. S., Yu, P. K. N., Watabe, H., Krstić, D., & Nikezić, D. (2023) A dosimetric comparison between ICRP and ORNL phantoms from exposure to 137Cs contaminated soil. Radiat Phys Chem, 207, 110878.

Biography

Milena P. Zivkovic was born on September 1, 1995, in Kragujevac, Serbia. She graduated with a remarkable academic record, achieving a 9.49 in her undergraduate studies during the 2018/2019 academic year. She was recognized as the top-performing student at the Faculty of Sciences and Mathematics for four consecutive years. Currently, Milena is pursuing her postgraduate studies at the Institute of Physics within the Faculty of Natural Sciences and Mathematics in Kragujevac. She has maintained an outstanding academic record, with a 9.67 average grade in her master's studies, specializing in physics. Milena has actively participated in various research projects, including the Ministry of Education-funded project on "Experimental and Theoretical Research in Radiation Physics and personalized treatment plans for patients. So far, she has published 30 papers, 8 of which are from the SCI list

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