

## ABSTRACT

**RESEARCH PAPER:** CIED Dose Estimates for Radiotherapy Patient Management

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Management for radiation therapy patients with Cardiovascular Implantable Electronic Devices (CIEDs) is incomplete. Manufacturers of CIEDs provide varying dose thresholds and precautions, which leads to ambiguity in planning patients' treatments. In cases where radiotherapy patients have a CIED, an American Association of Physicists in Medicine (AAPM) task group (TG 34<sup>5</sup>) developed a guideline for medical physicists to follow. However, specific calculations for the CIED dose need to be performed prior to application of the guide. Radiation oncology clinics would benefit from knowing typical CIED doses received from different treatments in order to expedite risk analyses. By utilizing previous patients' treatment plans – varying in target location and radiation delivery mode – average dose received by a CIED was measured and compared to the average recommended threshold of 2 Gy<sup>5</sup>. This was done for eleven different treatment plans. Most cases showed a cumulative dose well below the recommended 2 Gy, ranging from 3-53 cGy. However, two cases showed values that would raise concern – a 3D spine with a cumulative dose of 159 cGy and a volume modulated arc therapy (VMAT) head/neck of 329 cGy. With such large doses, this indicated a higher risk of CIED malfunction leading to potential patient complications.