

17060 - BOXcare

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Technology description

Radiotherapy in a box

Radiotherapy is the standard of care for locally-advanced disease and is a highly effective and curative treatment for patients with invasive cervical cancer. Brachytherapy is an essential component of radiotherapy treatment, yet this modality remains largely unavailable and inaccessible in low- and middle-income countries (LMICs), as well in rural and remote areas of Canada and other high-income countries. This lack of access has been driven by a treatment modality that has-- to date-- required unaffordable capital investments, a large power grid to support the electricity demand, and broader infrastructure supports.

BOXcare is a novel radiotherapy and cancer care system that will transform healthcare delivery for these under-served populations by enabling access to nuclear technology in both low-resource and unstable climates such as conflict-zones. It is the first of its kind to use prefabricated, modular structures for the delivery of these complex services.

BOXcare's high-dose rate (HDR) brachytherapy vault is a self-contained ecosystem, with a novel design and material management for the vault's radiation shielding, using standard requirements (NCRP 49) to achieve desired target dose rates for the public and staff. Our approach decreases the shielding weight, facilitating affordable and easy transport. We have also integrated a modified security system for the brachytherapy afterloader, which would prevent improper and unsafe use of the radioactive material required for treatment.

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