Washington University in St. Louis
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BRACHYTHERAPY DEVICE FOR OUTPATIENT, MRI-GUIDED TREATMENT OF GYNECOLOGICAL CANCERS

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Technology Description

Researchers in Dr. Perry Grigsby's lab have developed a patented brachytherapy device for outpatient, MRI-guided treatment of gynecological cancers. Gynecological cancers, such as recurrent endometrial and cervical cancers, can be treated with brachytherapy, but require specialized templates and applicators to deliver the correct dose. Currently these devices require invasive surgeries and strong pain medications to insert, resulting in patient discomfort and costly hospital stays. In contrast, this new device is made of lightweight, flexible, MRI-compatible material that can be adjusted to anatomical differences, eliminating the need for invasive surgeries and strong narcotics. Using this device, gynecological brachytherapy could be an outpatient process, leading to better patient prognosis and lower treatment costs.

Figure: (a) Template for treating recurrent endometrial cancers and cancers at the vaginal apex. (b) Implant and template for distal vaginal cancers.

Stage of Research

The device has been used in the brachytherapy clinic at Washington University School of Medicine since 2012. Clinical studies with 50 patients showed that patients treated with the device had similar outcomes to current templates, but with more comfort. These studies also demonstrated effective bead implantation and device insertion, with none of the treated patients requiring reimplantation.

Applications

- **Brachytherapy for gynecological cancers**

Key Advantages

- **Outpatient status lowers treatment costs**
- **Comfortable and MRI-compatible**
  - Adjustable template and applicator can be tailored to patient anatomy and reduce the risk of deep venous thrombosis and pulmonary embolism.
  - Smaller, lightweight design makes the device more comfortable to patients and easier to insert than conventional templates and applicators.
  - Patient pain can be managed using local anesthetics and over-the-counter medications, reducing treatment costs and potential complications.
  - Template and applicator material allow for MRI-aided implantation, eliminating the need for

invasive surgeries like laparotomies.

Publications

- Dyk, P. T., Richardson, S., Badiyan, S. N., Schwarz, J. K., Esthappan, J., Garcia-Ramirez, J. L., & Grigsby, P. W. (2015). Outpatient-based high-dose-rate interstitial brachytherapy for gynecologic malignancies. *Brachytherapy*, *14*(2), 231–237.

Patents

- Devices and methods for treatment of cancers (US Patent No. 10,322,298)