

# Systems and Methods for Flexible Sheath Locking with Integrated Shape Sensing

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## **Current radiotherapy techniques can cause damage to healthy cells**

Brachytherapy (BT) is a form of radiotherapy (RT) that uses specially designed needles to deliver radioactive isotopes inside the patient directly into a cancerous tumor. Although RT effectively kills cancer, it can cause damage to healthy tissues with significant treatment-related morbidity. BT also has various complications, including infection, cellulitis, seroma and hematoma.

Researchers at the Georgia Institute of Technology are developing a new surgical device that helps to more accurately deliver BT to a tumor (e.g., prostate cancer) without damaging healthy cells. The technology has the potential to improve the efficacy and safety of BT and enhance survival and quality of life.

## **A flexible sensing sheath improves the delivery of radiotherapy, potentially reducing morbidity**

This invention is a flexible and steerable sheath that can be used to insert devices (e.g., needles) into the body directly to specific tissues and tumors. The end of the sheath (stylet) has a sensor that obtains data to help control the device's motion through the body. A secondary device can be introduced to deliver therapeutics and/or collect diagnostics.

### **Summary Bullets**

- This technology aims to become a new steerable device to reduce the invasiveness of traditional methods for delivering drugs and diagnostic devices inside the body.
- There are no known existing methods of delivering radiotherapy without the potential of adversely affecting healthy cells.
- This device and method will enable drastic improvements in the quality of life of patients having to undergo radiotherapy treatment.

### **Solution Advantages**

- It can be viewed by MRI and/or ultrasound imaging

- It may reduce complications (puncture, bleeding, etc.) by allowing blunt needs to deliver therapeutics
- Ability to place non-steerable devices and other structures in a configuration
- Allows for flexibility and sensors to navigate through the body to deliver therapeutics or diagnostics

### Potential Commercial Applications

- BT Seeds; Brachytherapy; HDR BT needles
- Radiation Therapy (RT); Prostate Cancer
- Search and Rescue
- Industrial Tools

### Inventors

- Dr. Jaydev Desai  
Director, RoboMed Laboratory and Professor - Georgia Tech Wallace H. Coulter Department of Biomedical Engineering

### IP Status

<p>Patent application has been filed.</p>:

### Publications

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### Images

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