

# Fan-Beam Microwave Horn for Improved Organ Resection



**INVENTORS • David Mahvi, Mark Converse, Punit Prakash, John Webster**

**WARF: P07328US**

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**The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a medical device for microwave ablation in bloodless surgery and resection.**

## OVERVIEW

Liver cancer is the fifth most common cancer in the world and is frequently fatal. Surgical resection currently is the preferred treatment for liver cancer. During the time-consuming treatment, a surgeon cuts through tissue to remove a lobe of the liver while attempting to avoid or close large blood vessels. Blood loss during this procedure can adversely affect patient survival and increase hospital stay and complication rate.

Radio frequency (RF) or microwave (MW) ablation coagulates tissue before resection by inserting an electrode into the tissue and passing current from the electrodes through the patient to seal the tissue from blood flow. Unfortunately, the time required to remove and reapply the electrode to cover the necessary area of tissue makes the procedure too time-consuming for clinical practice. A procedure utilizing multiple electrodes with RF ablation procedure requires less time. However, a MW ablation solution to the issues of time and blood loss during resection is still needed.

## THE INVENTION

UW-Madison researchers have developed a dielectric-filled microwave waveguide-fed horn antenna applicator for bloodless surgery and resection, especially resection of the liver. The applicator is placed against the surface of the liver and microwave power is applied. The horn antenna applicator radiates microwaves uniformly into the tissue, causing coagulation. This design provides fast and efficient control of coagulation while allowing a bloodless resection area.

The planar design of the horn antenna application is superior to small or cylindrical radiator sources in that it provides less attenuation and a more constant temperature range in the coagulation region. The surface applicator also offers the user control because there is no need for imaging modalities such as ultrasound to confirm placement or coagulation.

## THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.



## BUSINESS OPPORTUNITY

- RITA Medical estimated that over 200,000 patients potentially could benefit from the use of similar RF ablation technologies.
- The market for such devices exceeds \$300 million dollars.
- Microwave ablation is potentially superior to these technologies and could take a significant portion of this market space.

## APPLICATIONS

- Liver and other organ resections performed by surgeons

## KEY BENEFITS

- Solves issue of blood loss during resection of organs
- Potentially could reduce one hour procedures to fifteen minutes
- Eliminates need for electrode array placement

## STAGE OF DEVELOPMENT

Built and tested in the researchers' laboratory (unlike other patented but only theoretical devices), with *in vivo* testing planned in the future.

## ADDITIONAL INFORMATION

### Related Technologies

[See WARF reference number P03367US for a method of RF ablation that uses an electrode array to heat tissue between electrodes.](#)

### Tech Fields

Medical Devices - Surgical devices

Radiation Therapy - Ablation

## CONTACT INFORMATION

For current licensing status, please contact Jeanine Burmania at [jeanine@warf.org](mailto:jeanine@warf.org) or 608-960-9846.

