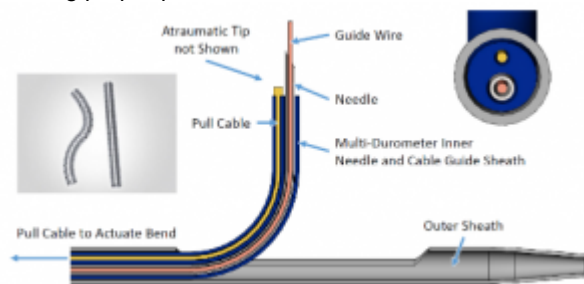


## TECHNOLOGY

# Device and Method for Transseptal Puncture

## OVERVIEW

Atrial fibrillation (AF) and mitral valve (MV) disease are two of the most common cardiac conditions. AF affects between 2.7 and 6.1 million American adults each year. MV disease is the most common heart valve lesion, impacting 1.7% of U.S. adults (9.3% of people  $\geq$  75 years old). Both AF and MV disease are frequently treated using catheter-based (percutaneous) technology that requires access to the left side of the heart using a transseptal puncture (TSP). TSP technology is a fertile target for innovation because TSP can be time-consuming, is imprecise in locating proper puncture location, is difficult to learn, and is associated with significant complications.



University of Maryland, Baltimore researchers have developed a novel (TSP) device and procedure that allows the surgeon to access structures on the left side of the heart from the right side of the heart. The device differs from those currently available as it provides a method for the surgeon to tune the stiffness of the device. This allows the device to remain flexible as it enters the vasculature and stiffen so that it can provide a stable platform for penetration of the fossa ovalis.

The fundamental design features of the invention are: 1) a stiffening element within the catheter that becomes a rigid platform from which to puncture the fossa ovalis (FO), 2) an element that can be advanced to the FO from the stiffened catheter from which the puncture needle is extended and, 3) a blunt tip at the end of the element that protects the FO from inadvertent puncture.

## APPLICATIONS

Cardiology

## ADVANTAGES

Improved safety and targeting of fossa ovalis in transseptal puncture.

## STAGE OF DEVELOPMENT

A prototype cannula and needle assembly has been created and tested in a porcine heart *in vitro*. Twenty computed tomography (CT) scans from pre-operative cardiac surgery patients were analyzed using the Osirix™ imaging platform in order to optimize preliminary device design parameters based on normal human anatomical measurements.

## LICENSING POTENTIAL

The lifetime risk of AF development in men > 40 years old is 26%, with AF contributing to > 99,000 deaths/year. An AF diagnosis adds \$8,700/year to the individual cost of treatment with an estimated impact on healthcare in the U.S. of \$26 billion/year. MV disease is the most common heart valve lesion, impacting 1.7% of U.S. adults (9.3% of people > 75 years old), with an estimated cost per hospitalization of \$51,415. Symptomatic MV disease increases annual health care expenditures by \$7.6 billion in the U.S., with an overall total incremental expenditure for valvular heart disease of \$23.4 billion.

## CONTACT INFO

Office of Technology Transfer  
620 W Lexington St., 4th Floor  
Baltimore, MD 21201  
Email: [ott@umaryland.edu](mailto:ott@umaryland.edu)  
Phone: (410) 706-2380

## Additional Information

### INSTITUTION

University of Maryland, Baltimore

### PATENT STATUS

U.S. Patent # 11,523,808 (issued 2022)

### LICENSE STATUS

An exclusive or nonexclusive license is available for this technology

### CATEGORIES

- Devices
- Surgical devices
- Methods of Treatment

### INVESTIGATOR(S)

James Gammie  
Rachel Quinn  
Chetan Pasrija

### ATTACHMENTS

-  [Download Marketing Summary JG-2017-030.pdf](#)

JG-2017-030