

# Innovative techniques for IVC filter removal result in 100 percent removal rate

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Most filters—whether for water or a furnace—eventually need to be removed or replaced to avoid complications.

Blood clot filters, which are implanted in the veins of people at risk of developing [blood clots](#) in their legs, require a similar precaution.

Complications have been found to arise when the filters, even those intended to be permanent, are left in longer than three to six months. These complications may include part of the filter breaking off and traveling to the heart and lungs, abdominal pain, filter tilt, and the filter tearing or creating a blockage in the veins of the abdomen (inferior vena cava) or in the legs. The chance of complications increases the longer the filter has been in place. Blood clot filters, also known as inferior vena cava (IVC) filters, potentially are dangerous and require specialized techniques to remove them.

## Rush team traps, covers, folds and removes filters

Interventional radiologists at Rush University Medical Center have pioneered methods to remove filters that previously couldn't be removed for various reasons. Some of the newest pioneered techniques are published in the November issue of the *Journal of Vascular and Interventional Radiology* by the interventional radiology team at Rush.

"We have both the standard retrieval methods as well as the most

advanced tools to remove any type of filter, and we have the medical expertise to treat any complications from the filter being implanted," says Osman Ahmed, MD, primary author and interventional radiologist at Rush University Medical Center and Rush Oak Park Hospital.

The techniques involve a careful method of catching or "snaring" the filter to hold it in place and then covering it to prevent parts of it breaking free. The team also uses tools such as alligator forceps and excimer laser,

Thanks to these methods, the Rush team has achieved a 100 percent retrieval rate over the past five years, including difficult-to-remove filters from patients who have been referred to Rush from other hospitals.

The minimally invasive procedure is performed on an outpatient basis using twilight (conscious) sedation in the interventional radiology suite, which is similar to an operating room but also includes special imaging equipment. More advanced retrievals are performed using general anesthesia due to the time it may take to remove the filter.

The filter removal is performed through a small incision in the neck or groin (the maximum size is around 5 mm) and the filter is removed using X-ray guidance to manipulate wires, catheters, and other devices necessary to remove the filter, which can be up to 29 mm in length.

## **All patients with an IVC filter should consult specialist about removing it**

The Rush team lead by Bulent Arslan, MD, and Ulku Turba, MD, developed these techniques to remove IVC filters, which are implanted in the inferior vena cava, a large vein just below the kidneys, in order to

trap blood clots before they travel to the heart and lungs and cause permanent damage. Arslan is associate professor of radiology and director, vascular and [interventional radiology](#). Turba is associate professor of diagnostic radiology.

While there are a variety of risk factors and illness that can lead to [blood clot formation](#), some blood clots produce no symptoms until they become dislocated and travel to other sites in the circulatory system. Some of the causes of blood clot formation can include heart conditions, prolonged immobility, smoking, surgery or inherited blood-clotting disorders.

IVC retrievable filters were approved by the U.S. Food and Drug Administration (FDA) in 2003 and 2004 and were recommended for deep vein thrombosis (leg pain due to circulation problems caused by clots) in 2012. The length of time the filter is left inside the body depends on the expected amount of time that protection is needed to prevent a blood clot from traveling up to the heart and lungs.

"Unfortunately, [filters](#) are not always removed once the initial threat of a blood clots traveling to the heart and lungs subsides, because there hasn't previously been awareness of the potential risks of leaving them in," says Sreekumar Madassery, MD, an interventional radiologist at Rush University Medical Center and Rush Oak Park Hospital.

The FDA now recommends that anyone who has an IVC filter talk to an interventional radiologist about having the filter removed as soon as possible. Not every filter should be removed, but everyone who has one should be evaluated.

Provided by Rush University Medical Center

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