

# Doctor, I am at risk of blood clots travelling to my lungs. Should I agree to insertion of a filter to protect me?

In people at risk of having a DVT travel from their leg to their lungs (PE), there are very few studies assessing the use of an inferior vena cava filter (IVCF) to prevent PE or death. Overall, it appears that these filters can reduce the risk of blood clots reaching the lungs. However, inserting these filters into a large vein in the pelvis can lead to a higher risk of developing a new DVT in the legs, and they do not decrease the risk of death compared to not inserting a filter.

## What's the evidence?

### Understanding the problem

The first-choice treatment for venous thromboembolism is anticoagulants, which prevent blood clots from becoming larger or travelling from the leg to the lungs (PE) and new clots from forming (recurrent VTE). Because some people cannot take anticoagulants or are at high risk of developing a new or recurrent PE, IVCFs have been used for many years as an alternative treatment option or in addition to anticoagulants.

IVCFs are inserted through the skin at the groin or neck and placed into the largest vein of the pelvis, which carries blood from the lower body back to the heart. They have an umbrella-like form and allow blood to pass but are designed to catch medium- or large-sized blood clots. Unlike anticoagulants, IVCFs do not increase the risk of bleeding, and they can be used during surgery. Most of the filters used nowadays can be removed once they are no longer needed. However, complications can occur, such as insertion problems; broken filters (with pieces later travelling to other body parts), or blockage of the filter by blood clots. Also, the longer filters are left in place, the more likely they will become attached to the vein wall, making retrieval difficult or impossible.

Although IVCFs are widely used, particularly in the U.S., only a few studies have actually evaluated the benefits and risks of IVCF use compared to no filter use. Therefore, expert recommendations are not consistent.

The aim of this article was to report the results of a systematic review and meta-analysis that identified and combined published studies assessing the risks and benefits of **IVCFs** in people at risk of developing **PE**.

## The research

A summary of 11 studies published up to October 2016.

**Who?** The studies included 4204 people who were at risk of developing PE for various reasons. The study group received an IVCF, and the control group received usual care without an IVCF. Studies were included if patients entered the study before or at the time of the IVCF insertion.

**What?** The studies compared IVCF use with no IVCF use.

IVCF	vs	No IVCF
Insertion of a retrievable or permanent IVCF.  Reasons for IVCF insertion as well as the remainder of the treatment were defined by the study design or the treating physicians and varied between studies.		Usual care, including anticoagulants and/or supportive measures.  Usual care was defined by the study design or the treating physicians and varied between studies.

## What the researchers found

**The quality of the included studies was low to moderate.**

**People with an IVCF were less likely to have a new or recurrent PE. However, they were more likely to develop new DVT.**

**Insertion of an IVCF did not reduce the risk of death due to PE or death from any cause compared with no filter use.**

## Summary of findings

**IVCF use vs no IVCF use in people who are at risk for PE for various reasons**

Outcomes	Rate of events with IVCF	Rate of events without IVCF	Results	Number of studies and quality of the evidence
PE	2 out of 100 people	5 out of 100 people	About 3 fewer people out of 100 had a PE after insertion of an IVCF	11 studies <b>low quality</b> of evidence

<b>Outcomes</b>	<b>Rate of events with IVCF</b>	<b>Rate of events without IVCF</b>	<b>Results</b>	<b>Number of studies and quality of the evidence</b>
Death due to PE	1 out of 100 people	2 out of 100 people	No difference*	11 studies <b>low quality</b> of evidence
Death due to any cause	8 out of 100 people	9 out of 100 people	No difference*	10 studies <b>low quality</b> of evidence
<b>DVT</b>	5 out of 100 people	3 out of 100 people	About 2 more people out of 100 had a DVT after insertion of an IVCF	10 studies <b>moderate quality</b> of evidence

\*Although the rates for the 2 groups look different, the differences were not statistically significant—this means that the difference could simply be due to chance rather than due to the different treatments.

*This Evidence Summary is based on the following article:*

*Bikdeli B, Chatterjee S, Desai NR, et al. **Inferior Vena Cava Filters to Prevent Pulmonary Embolism: Systematic Review and Meta-Analysis.** J Am Coll Cardiol. 2017 Sep 26;70(13):1587-1597. doi: 10.1016/j.jacc.2017.07.775. PubMed (<https://www.ncbi.nlm.nih.gov/pubmed/28935036?dopt=Abstract>)*

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