

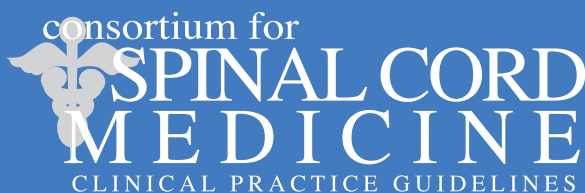
SPINAL CORD MEDICINE

BLOOD CLOTS

CONSUMER GUIDE:

Blood Clots: What You Should Know

A Consumer Guide for People with Spinal Cord Injury



The Mount Sinai Hospital
Rehabilitation and Human Performance

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**Paralyzed Veterans
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Blood Clots: What You Should Know

A Consumer Guide for People with Spinal Cord Injury



Administrative and financial support provided by Paralyzed Veterans of America Education Foundation

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This guide has been prepared based on scientific and professional information found in *Prevention of Venous Thromboembolism in Individuals with Spinal Cord Injury: A Clinical Practice Guideline for Health-Care Professionals* published in 2016. Users of this guide should periodically review this material to ensure that the advice herein is consistent with current reasonable clinical practice. The websites noted in this document were current at the time of publication; however, because web addresses and the information contained therein change frequently, the reader is encouraged to stay apprised of the most current information.

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On behalf of the Consumer Guide panel, we want to first acknowledge the leadership of the guideline panel, namely the Chair, David Chen, in guiding the development of *The Clinical Practice Guideline for Prevention of Venous Thromboembolism in Individuals with Spinal Cord Injury*.

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In addition, we wish to acknowledge the ongoing support of PVA, especially National President, David Zurfluh; Executive Director, Carl Blake; Director of Research and Education, Cheryl Vines; as well as the rest of the leadership team, without whose support these consumer guides would not exist.

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Jill K. Gregory, CMI, FAMI, Certified Medical-Illustrator
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The Consumer Guide Panel

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What do I need to know?

Blood clots are dangerous and can kill you

- **Go to the emergency room right away or call your doctor if you think you have a blood clot; a blood clot can occur in your arms, legs, and/or lungs**

Symptoms of blood clots

- **A few of the most common symptoms of a blood clot in the arms and legs are:**
 - Calf pain if the clot is in the legs
 - Warmth
 - Swelling
- **A few of the most common symptoms of a blood clot in the lungs are:**
 - Hard time breathing
 - Coughing up blood
 - Chest pain
 - Heart beating fast

Preventing blood clots

- **For persons with a new spinal cord injury:**
 - Wear a device that squeezes your calves in the hospital
 - Wear compression stockings/socks
 - Start blood thinners as soon as possible and continue for at least eight weeks
- **For persons with a chronic spinal cord injury:**
 - Start blood thinners to prevent blood clots if you are hospitalized
 - Stay active
 - Make sure you visit your doctor regularly, and manage any medical problems

Treating blood clots

- **Blood clots are treated with blood thinners:**
 - If you have a blood clot in the leg, your doctor may have you continue blood thinners for 3-6 months
 - If you have a blood clot in the lungs, your doctor may have you continue blood thinners for 6 months
 - If you have had blood clots multiple times, your doctor may have you continue blood thinners for life

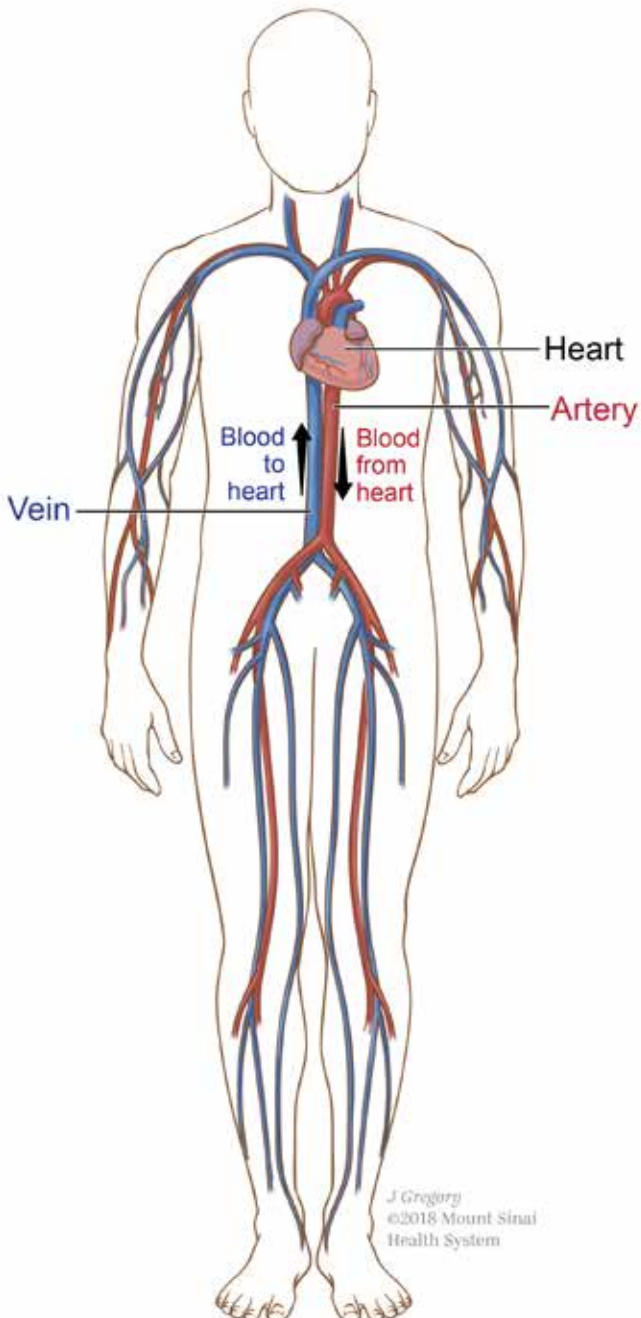
- **In rare cases, blood clots can be treated by dissolving the blood clot ([thrombolysis](#)) or by taking the clot out by a special procedure called [thrombectomy](#).**
 - If you have an IVC filter that has been in place less than 8 weeks, ask your doctor about removing the filter.
 - You can continue with therapy and other physical activities after receiving blood thinners for blood clots.
 - In some cases, blood thinners can make bleeding worse or harder to stop – Be sure to contact your doctor if you have problems with bleeding.

Introduction

Blood clots are serious and can kill you. Blood clots occur in more than half of those with spinal cord injury who do not receive blood thinners. It is one of the leading causes of death in people with spinal cord injury within the first year after injury. This Consumer Guide will not only help you understand the signs and symptoms of blood clots, but also help you understand how to prevent and treat blood clots. As you read this Consumer Guide, please keep in mind that all recommendations and suggestions should be discussed with your personal doctor and your healthcare team.

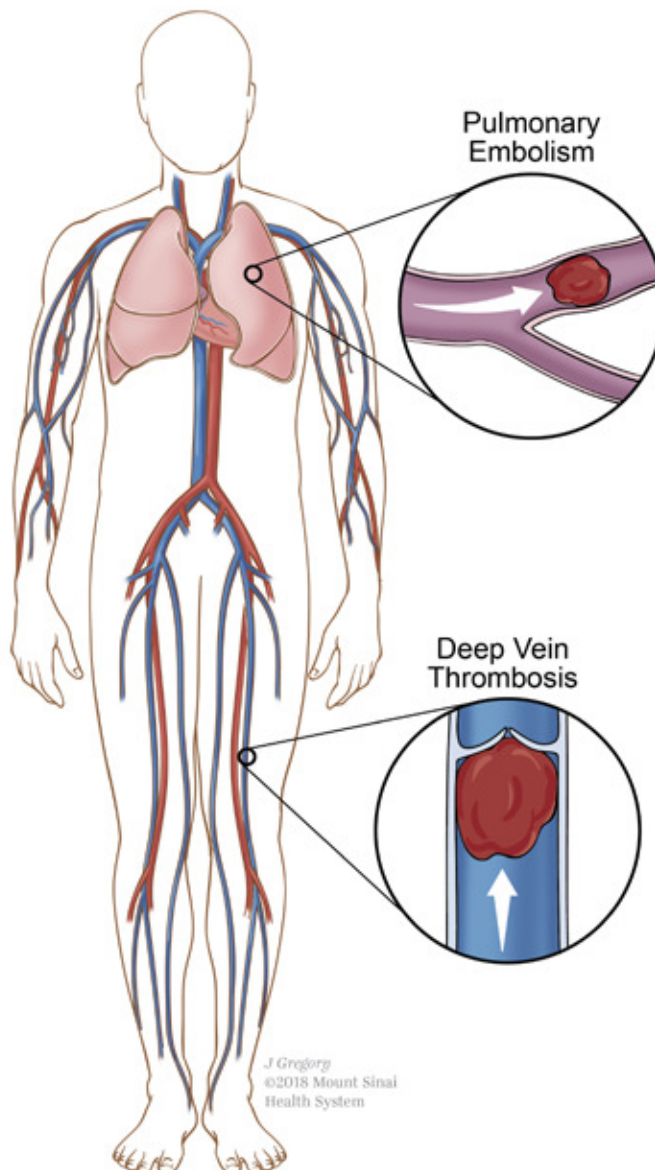
What is the difference between an artery and vein?

- An [artery](#) is a blood vessel that carries blood away from the heart to all parts of the body. A [vein](#) is a blood vessel that carries blood back to the heart from all parts of the body.



What is a blood clot?

- A blood clot is a clump of dried blood that blocks the flow of blood in a blood vessel. A clot in a deep (or large) vein of the body is called [deep vein thrombosis](#) or DVT. A blood clot in the lungs is called a pulmonary embolism or PE.
- [Pulmonary embolisms](#) can either be formed in the lungs, especially in individuals with chest trauma, or they can break off clots in other parts of the body, travel through the blood stream, and get clogged in the lungs. Blood clots are serious and can be deadly.



What is so dangerous about a blood clot?

- If you have a blood clot in the lungs, you can suddenly die. Therefore, it is very important for you to get medical help right away if you have any of the symptoms listed below:
 - A hard time breathing
 - Chest pain especially when taking a deep breath
 - Coughing up blood
 - An unexplained cough
 - A fast heartbeat



- If you have a blood clot in the legs, you are at-risk of developing chronic pain and swelling, called [post-thrombotic syndrome](#). Symptoms include:

- Chronic swelling
- Chronic pain, pressure, heaviness or tightness
- Skin hardening, dryness, or itching
- Darker skin color, visible spider veins
- Skin breakdown



How do I know if I have a blood clot?

- You may have a blood clot in your vein if you see or feel the following in your arms or legs:
 - Pain
 - Swelling
 - Warmth
 - Blue-purple skin color



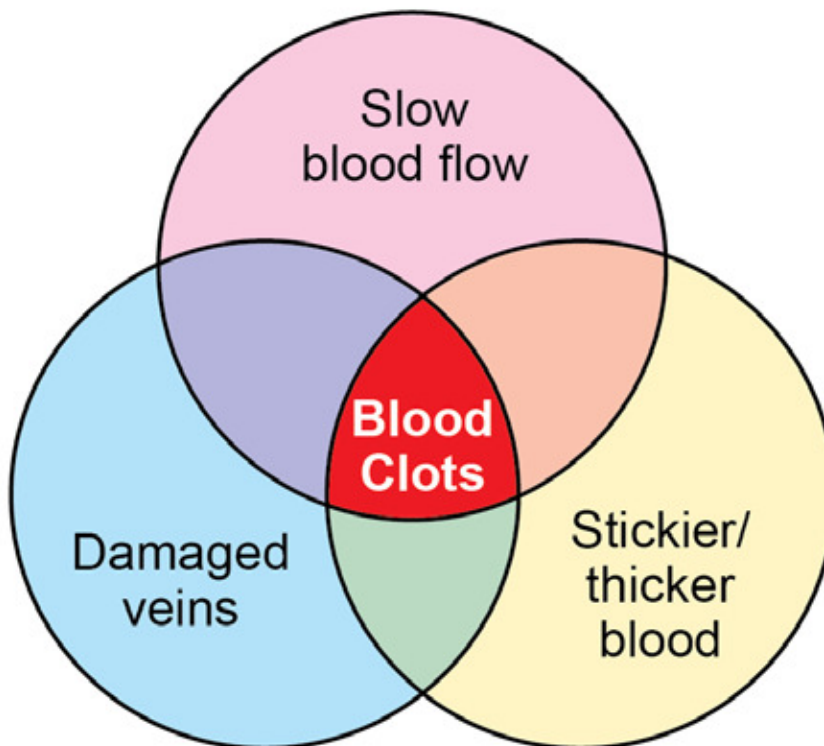
- You may have a blood clot in your lungs if you have:
 - A hard time breathing
 - Chest pain especially when taking a deep breath
 - Coughing up blood
 - An unexplained cough
 - A fast heartbeat



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Why do I get blood clots?

- People with a spinal cord injury often develop the following conditions that make them more likely to get a blood clot:
 - Slow blood flow (especially within the first year after a spinal cord injury)
 - Damaged veins
 - Stickier/thicker blood (more likely to clot)



- Blood clots happen most often during the first two weeks after injury
- Blood clots are more likely to occur in individuals with [complete spinal cord injury](#)
- Blood clots are more likely to occur in persons with [paraplegia](#) compared to those with [tetraplegia](#)
- Blood clots in the lungs are not related to paraplegia versus tetraplegia or complete versus [incomplete spinal cord injury](#)

What kind of test can doctors order to look for blood clots?

Imaging studies for blood clots in your arms or legs:

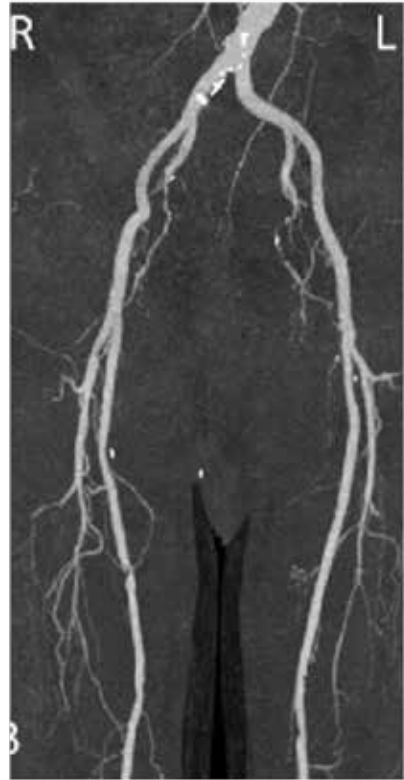
Doppler Ultrasound

- A Doppler ultrasound is often the preferred test because it is accurate, painless and not invasive
 - A Doppler ultrasound is a non-invasive test that uses high-frequency sound waves (ultrasound) to measure the amount of blood flow through your arteries and veins
- How do I prepare for an ultrasound?
 - No preparation is required
 - What happens during an ultrasound?
 - You are normally asked to lie down on a bed with your arms or legs exposed while the rest of the body is covered
 - Clear gel is applied to the skin and a hand-held device is moved across the area to allow the image to project onto the screen
 - Are there any after effects of an ultrasound?
 - No
 - How long does an ultrasound take?
 - 30–60 minutes
 - What are the risks of an ultrasound?
 - An ultrasound is a safe exam without any significant risk



Contrast Venogram

- An x-ray test that uses an injection of a dye to show how blood flows through your veins
- A contrast venogram is ordered if a Doppler ultrasound is not possible
 - How do I prepare for a venogram?
 - You may be asked to obtain blood work to check your kidney function
 - You may be asked not to eat or drink except water for 2-4 hours
 - What happens during a venogram?
 - You will lie on your back on the x-ray table
 - They will insert a needle with a plastic tube into your vein and inject the dye
 - X-rays will be taken at timed intervals as the dye moves through your veins
 - Are there any after effects of a venogram?
 - Most people have no after effects at all
 - After the test, you should be able to eat and drink as normal and resume regular activities
 - The dye that is injected may cause a strange metallic taste in the mouth and cause a warm sensation through the body. It is a common sensation and usually goes away within a couple of minutes.
 - How long does a venogram take?
 - The amount of time is usually under 10 minutes
 - The preparation time varies and is often much longer than the scan itself
 - What are the risks of a venogram?
 - Radiation exposure since a CT scan uses x-rays to take pictures, and x-rays are a form of radiation
 - Small risk of an allergic reaction to the dye



Computed Tomography with contrast (CT scan)

- **Also known as a CT scan, using x-rays to take pictures in very fine slices**
- **Dye is injected to make the blood vessels more visible**
 - How do I prepare for a CT scan?
 - You may be asked to obtain blood work to check your kidney function
 - Before the test, you may be asked not to eat or drink except water for 2-4 hours
 - They will insert a needle with a plastic tub into your vein to inject the dye
 - What happens during a CT scan?
 - CT scan is a large square machine with a circular hole
 - You will be asked to lie on a bed attached to the scanner
 - The bed will be raised up to the height level with the circular hole and the bed slides in and out of the hole several times while pictures are being taken
 - Are there any after effects of a CT scan?
 - Most people have no after effects at all
 - After the test, you should be able to eat and drink as normal and resume regular activities
 - The dye that is injected may cause a strange metallic taste in the mouth and feel a warm sensation through the body. It is a common sensation and usually goes away after a couple of minutes.
 - How long does a CT scan take?
 - The amount of time you are in the CT scanner is usually under 10 minutes
 - The preparation time varies and is often much longer than the scan itself
 - What are the risks of a CT scan?
 - Radiation exposure since CT scan uses x-rays to take pictures, and x-rays are a form of radiation
 - Small risk of an allergic reaction to the dye



Ventilation/perfusion (VQ) lung scan

- A VQ scan is actually two scans
- It is carried out in two parts:
 - In the first part, radioactive material is breathed in and pictures are taken to look at the airflow in the lungs
 - In the second part, a different radioactive material is injected into a vein and more images are taken to see the blood flow in the lungs
- How do I prepare for a VQ scan?
 - No preparation is required
- What happens during a VQ scan?
 - **Part 1:** You will be given a small dose of radioactive material to breath for a few minutes
 - You will then lie down on a table and images of your lungs will be taken
 - **Part 2:** A different radioactive material is injected into your vein
 - A second set of images of your lungs will be taken
- What happens to the radioactive material?
 - The radioactive material will be eliminated from your body within 24 hours of the scan
 - Part of it will pass out of your body through your urine and the rest will disappear
- Are there any after effects of a VQ scan?
 - There are no after effects from a VQ scan
- How long does a VQ scan take?
 - 30–60 minutes
- What are the risks of a VQ scan?
 - Minimal risks are involved in the VQ scan
 - Allergic reaction to the radioactive material is rare



Why do we NOT always look for blood clots in everyone if they are so dangerous?

- **We do NOT look for blood clots in everyone because:**

- The [Doppler ultrasound](#) is not great at finding blood clots if you do not have symptoms
- Looking for blood clots in persons without symptoms has NOT been shown to prevent people from getting blood clots in the legs or lungs

- **We look for blood clots based on your symptoms.**

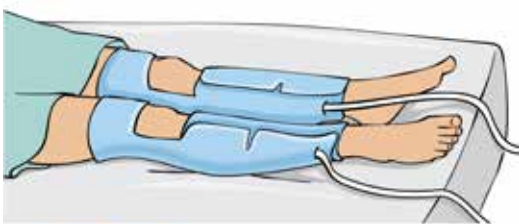
- The blood clot in your arms or legs can cause:
 - Pain
 - Swelling
 - Warmth
 - Blue-purple skin color
- The blood clot in your lungs can cause:
 - A hard time breathing
 - Chest pain, especially when taking a deep breath
 - Coughing up blood
 - An unexplained cough
 - A fast heartbeat



How do you prevent a blood clot after a spinal cord injury?

- **For persons with a new spinal cord injury:**

- Wear a device that squeezes your calves in the hospital
- Wear compression stockings/socks
- Start blood thinners as soon as possible for at least eight (8) weeks



- **For persons with a chronic spinal cord injury:**

- Start [blood thinners](#) (also called [anticoagulants](#)) to prevent blood clots if you are hospitalized
- Stay active
- Make sure you go visit your doctor regularly and manage any medical problems



- **Your risk of getting a blood clot increases if you are:**

- Flying
- Developing/developed cancer
- Taking estrogen or having a hormone replacement
- Smoking
- Pregnant
- Taking birth control pills



What do I do if I have a blood clot?

- If you think you have a blood clot, call your doctor or go to the emergency room right away.



- If a doctor tells you that you have a blood clot, you will be started on blood thinners, unless the risk of bleeding is more dangerous than the clot itself.



Blood
Thinners



Clot
Busters



IVC
Filter



Mechanical
Thrombectomy

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If I have a blood clot, why do my doctors NOT always look to see if the blood clot is gone after treatment?

- We do NOT always look for blood clots after treatment because:
 - If someone has been treated with a blood thinner for 3-6 months, the risk of the same blood clot causing further problems is very small
- We look for blood clots if you have new symptoms.
 - The blood clot in your arms or legs can cause:
 - Pain
 - Swelling
 - Warmth
 - Blue-purple skin color
 - The blood clot in your lungs can cause:
 - A hard time breathing
 - Chest pain, especially when taking a deep breath
 - Coughing up blood
 - An unexplained cough
 - A fast heartbeat



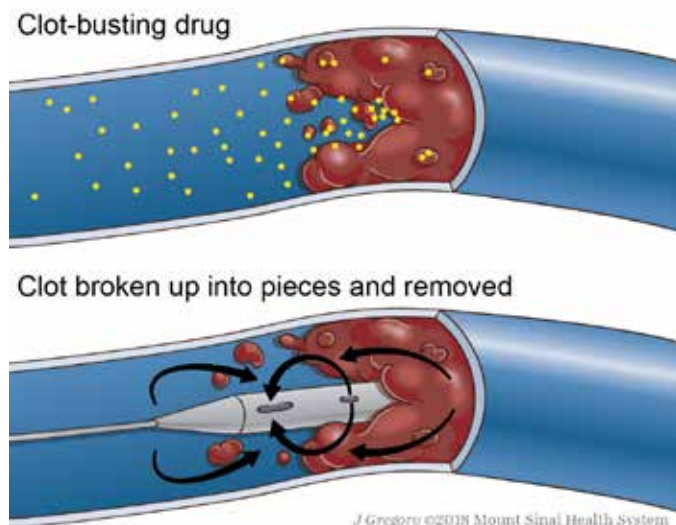
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How long do I have to be on blood thinners?

- If you have a blood clot in the leg, your doctor may have you continue blood thinners for 3-6 months
- If you have a blood clot in the lungs, your doctor may have you continue blood thinners for 6 months
- If you have had blood clots multiple times, your doctor may have you continue blood thinners for life



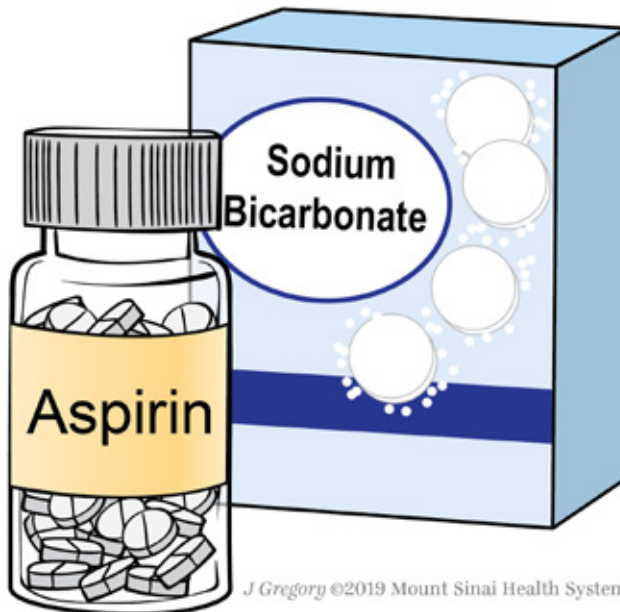
- In rare cases, blood clots can be treated by dissolving the blood clot (thrombolysis) or taking the clot out by a special procedure called thrombectomy. These are not commonly done because the risk/benefit of the procedure (i.e. bleeding and complication) is greater than with blood thinners.



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What do I need to know about the blood thinners?

- Blood thinners work well when they are used correctly
- There are different types of blood thinners your doctor may prescribe
- Always take your blood thinner as directed by your doctor
- Tell your doctor about every medication you are taking
- Other medications can change the way your blood thinner works
 - Common over-the-counter medications that may interact with blood thinners include:
 - Acetylsalicylic acid (Aspirin)
 - Ibuprofen (Advil, Motrin)
 - Naproxen (Aleve)
 - Anhydrous Citric Acid and Sodium Bicarbonate (Alka-Seltzer)
 - Acetaminophen, Acetylsalicylic Acid, Caffeine (Excedrin)



- **In some cases, blood thinners can make bleeding worse or harder to stop:**
 - Menstrual bleeding may be heavier than normal
 - Bleeding from a cut may be harder to stop
 - Bleeding from the gums or nose may not stop quickly
 - More frequent nose bleeds



Be sure to contact your doctor if you have problems with bleeding

• **Blood thinners can be injected or taken as an oral medication:**

◦ Injections

- These medications are given as a shot under your skin
- A nurse or trained health care professional will give you this medication
- You may be taught how to give your medicine as a shot under your skin, called subcutaneous injection, at home
- Understand how to give this medicine safely before you do it at home
 - Heparin also known as unfractionated heparin
 - Low-weight molecular heparin
 - ◆ Preferred over unfractionated heparin for prevention of blood clots

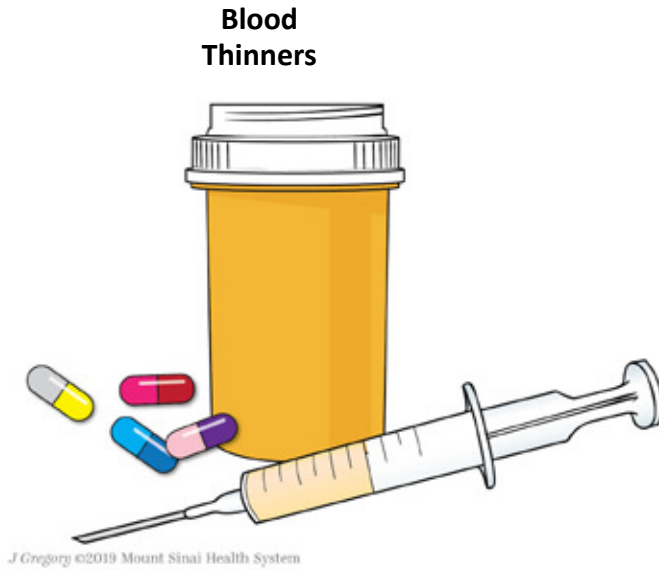


◦ Oral medication

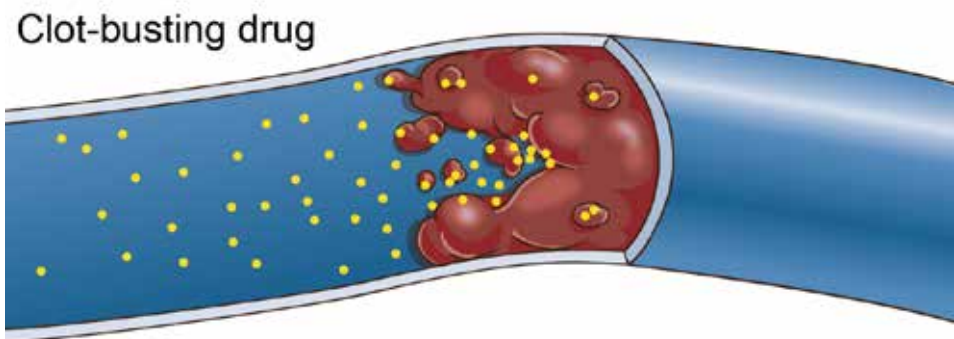
- Coumadin (Warfarin)
 - Will need frequent blood tests
 - Foods which contain vitamin K can impact the effect of warfarin
 - For a list of foods that contain vitamin K
 - ◆ Go to USDA homepage - [here](#)
 - ◆ Search for “vitamin K”
- Other Oral blood thinners
 - Example: Apixaban (Eliquis), Dabigatran etexilate (Pradaxa), Rivaroxaban (Xarelto)
 - No food interaction

What is the difference between a blood thinner and clot buster?

- A blood thinner helps prevent new clots from developing

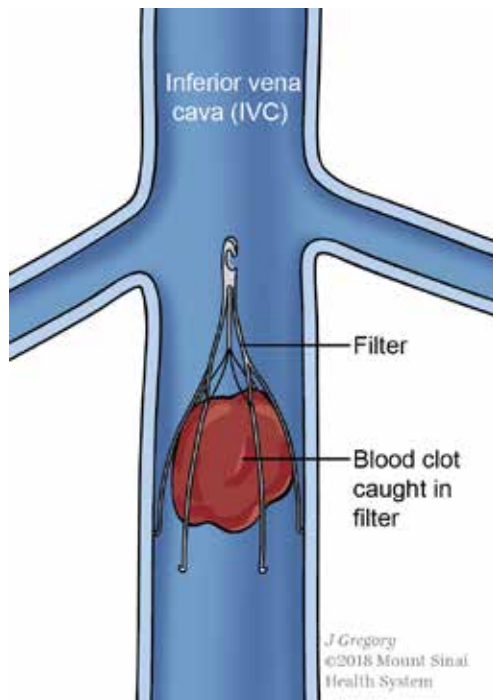


- A clot buster, also known as thrombolysis, dissolves the clot



What is an IVC filter?

- [Inferior vena cava \(IVC\) filters](#) are umbrella shaped nets placed in a large vein in your abdomen
- The filter traps any blood clots that break loose from reaching the lungs
- These filters are used in patients who cannot take blood thinners because they are bleeding or are at a high risk of bleeding

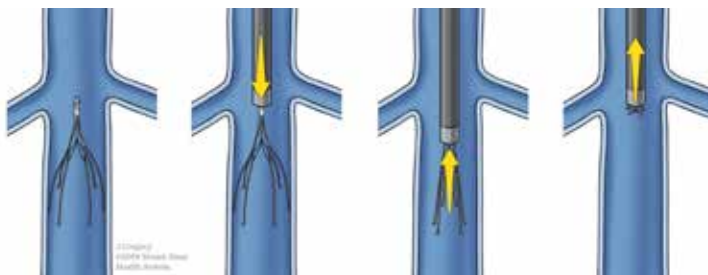


What do I need to know about an IVC filter? Can I have the filter taken out?

- An IVC filter can be permanent/non-removable or temporary/removable
- Ask your doctor what type of filter you have
- If you have a removable IVC filter that has been in place less than 8 weeks, ask your doctor about removing the filter
- Removable IVC filters are taken out after eight weeks, once the risk of getting a blood clot in your lungs has decreased

• Removing an IVC filter

- What do I have to do before the procedure?
 - Do not eat or drink anything after midnight before your procedure
 - You may need to stop taking aspirin, [non-steroidal anti-inflammatory drugs](#) or blood thinners for a specific period of time before your procedure
 - You should plan to have a relative or a friend drive you home after the procedure
- How does the procedure work?
 - The doctor will give you sleeping and pain medication before the start of the procedure; the medication will make you feel relaxed and sleepy
 - You may or may not be awake, depending on how deeply you are sedated
 - Using image guidance, a [catheter](#) is inserted in a large vein in the neck or groin and advanced to the abdomen to remove the filter
 - A special device called a [retrieval snare](#) will be used to hook the filter back inside the catheter and taken out



- The procedure will take 30 to 90 minutes
- After the procedure, you will stay in the recovery room until you are completely awake and ready to return home or back to your hospital room
- This usually lasts about 2 hours
- What happens after the procedure?
 - If the filter was removed through a vein in your neck, you may resume your normal activities within 24 hours
 - If the filter was removed through a vein in your groin, you should avoid lifting heavy objects for 48 hours
 - You may resume your regular diet immediately after the procedure

Can I continue with therapy or other physical activity if I have a blood clot?

- Yes, you can return to therapy or other physical activity after you have a blood clot



- You should first go to the emergency room or call your doctor to start blood thinners before resuming your therapy or activity



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What do these words mean?

- **Artery** – a blood vessel that carries blood away from the heart to all parts of the body
- **Anticoagulant** – medication that makes your blood less likely to clump together
- **Blood thinner** – another name for medication that makes your blood less likely to clump together
- **Blood clots** – blood that clumps together
- **Catheter** – a thin, flexible tube
- **Complete Spinal Cord Injury** – total lack of sensation and movement below the level of injury
- **Deep vein thrombosis** – a blood clot in the vein of the legs or arms
- **Doppler ultrasound** – a non-invasive test that uses high-frequency sound waves (ultrasound) to measure the amount of blood flow through your arteries and veins
- **Incomplete Spinal Cord Injury** – some sensation and/or movement below the level of injury
- **Inferior vena cava (IVC) filters** – umbrella shaped net placed in a large vein in your abdomen
- **Non-steroidal anti-inflammatory drugs** – types of medication used to decrease inflammation and pain
- **Paraplegia** – injury below the neck causing weakness and/or decreased sensation in the legs
- **Post-thrombotic syndrome** – ongoing symptoms of a blood clot in the leg; list of symptoms [here](#)
- **Pulmonary embolism** – blood clot in the lungs
- **Retrieval snare** – special device used to remove IVC filters
- **Tetraplegia** – injury at the neck causing weakness and/or decreased sensation in both the arms and legs
- **Thrombectomy** – remove blood clot
- **Thrombolysis** – dissolve blood clot
- **Vein** – a blood vessel that carries blood back to the heart from all parts of the body



consortium for
**SPINAL CORD
MEDICINE**
CLINICAL PRACTICE GUIDELINES



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