

Deep Vein Thrombosis (DVT)

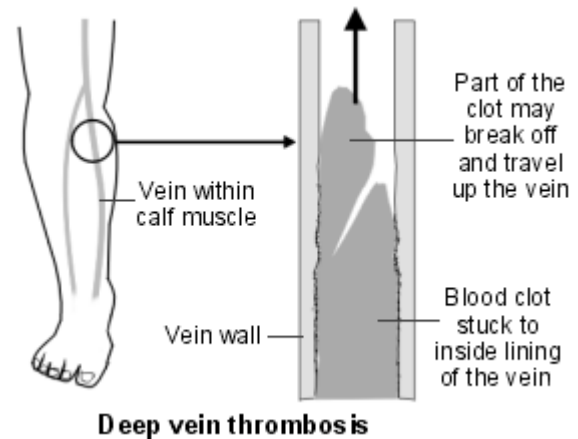
A deep vein thrombosis (DVT) is a blood clot in a vein, usually a leg vein. The common cause is immobility. A complication occurs in some cases where part of the blood clot breaks off and travels to the lung (pulmonary embolus). This is usually prevented if you are given anticoagulation treatment.

What is a deep vein thrombosis?

A deep vein thrombosis (DVT) is a blood clot that forms in a deep leg vein. Veins are blood vessels that take blood towards the heart.

Deep leg veins are the larger veins that go through the muscles of the calf and thighs. (They are not the veins that you can see just below the skin.) When you have a DVT the blood flow in the vein is partially or completely blocked, depending on whether the blood clot partially or completely fills the width of the vein.

A calf vein is the common site for a DVT. A thigh vein is less commonly affected. Rarely, other deep veins in the body form blood clots.



Why do blood clots form in leg veins?

Blood normally flows quickly through veins, and does not usually clot. Blood flow in leg veins is helped along by leg movements, because muscle action squeezes the veins. Sometimes a DVT occurs for no apparent reason. However, the following increase the risk of having a DVT.

- **Immobility** which causes blood flow in the veins to be slow. Slow flowing blood is more likely to clot than normal flowing blood.
 - **A surgical operation that lasts more than 30 minutes** is the most common cause of a DVT. The legs become still when you are under anaesthetic. Blood flow in the leg veins can become very slow.
 - **Any illness or injury that causes immobility** increases the risk of a DVT.
 - **Long journeys by plane, train, etc**, may cause a slightly increased risk of DVT.
- **Damage to the inside lining of the vein** increases the risk of a blood clot forming. For example, a DVT may damage the lining of the vein. So, if you have a DVT, then you have a higher than average risk of having another one sometime in the future. Some conditions such as vasculitis (inflammation of the vein wall) and some drugs (for example, some chemotherapy drugs) can damage the vein and increase the risk of having a DVT.
- **Conditions that cause the blood to clot more easily than normal** (thrombophilia) can increase the risk of having a DVT. Some medical conditions can cause the blood to clot more easily than usual. For example, nephrotic syndrome and antiphospholipid syndrome. Some rare inherited conditions can also cause the blood to clot more easily than normal. For example, factor V leiden.
- **The contraceptive pill and hormone replacement therapy (HRT)** that contain oestrogen can cause the blood to clot slightly more easily. Women taking 'the pill' or 'HRT' have a small increased risk of DVT.
- **People with cancer or heart failure** have an increased risk of having a DVT.
- **Older people** are more likely to have a DVT, particularly if you have poor mobility or have a serious illness such as cancer.
- **Pregnancy** increases the risk. About 1 in 1000 pregnant women have a DVT.
- **Obesity** also increases the risk of having a DVT.

How common is a deep vein thrombosis?

It is estimated that about 1 in 2000 people have a DVT each year in the UK. This ranges from less than 1 in 3000 in people under the age of 40 years to up to 1 in 500 in those over 80 years.

What are the symptoms of a deep vein thrombosis?

The typical symptoms are pain, tenderness, and swelling of the calf. Blood that would normally go through the blocked vein is diverted to outer veins. The calf may then become warm and red. Sometimes there are no symptoms and a DVT is only diagnosed if a complication occurs such as a pulmonary embolus (see below).

Do I need any tests?

Sometimes it is difficult for a doctor to be sure of the diagnosis from just the symptoms as there are other causes of a painful and swollen calf. For example, a muscle strain or infection. If you have a suspected DVT you will normally be advised to have tests done urgently to confirm or rule out the diagnosis. Two commonly used tests are:

- The D-dimer test. This is blood test that detects fragments of the breakdown products of a blood clot. The higher the level, the more likely that you have a blood clot in a vein.
- An ultrasound scan of the leg which can often detect a clot in a vein.

Sometimes these tests are not 100% conclusive and more detailed tests are necessary. For example, contrast venography. In this test a dye is injected into the leg veins. X-ray tests can then detect the dye which is shown not to be flowing if a vein is blocked by a clot.

Is a deep vein thrombosis serious?

It can be. When a blood clot forms in a leg vein it usually remains stuck to the vein wall. The symptoms tend to settle gradually. However, there are two main possible complications:

- Pulmonary embolus (a blood clot that travels to the lung).
- Post thrombotic syndrome (persistent calf symptoms).

Pulmonary embolus

In a small number of people who have a DVT, a part of the blood clot breaks off. This travels in the bloodstream and is called an embolus. An embolus will travel in the bloodstream until it becomes stuck. An embolus that comes from a clot in a leg vein will be carried up the larger leg and body veins to the heart, through the large heart chambers, but will get stuck in a blood vessel going to a lung. This is called a pulmonary embolus.

A small pulmonary embolus may not cause any symptoms. A medium sized pulmonary embolus can cause breathing problems and chest pain. A large pulmonary embolus can cause collapse and sudden death. It is estimated that about 1 in 10 people with an untreated DVT develop a pulmonary embolus large enough to cause symptoms or death.

Post-thrombotic syndrome

Without treatment, up to 6 in 10 people who have a DVT develop long-term symptoms in the calf. This is called 'post-thrombotic syndrome'. Symptoms occur because the increased flow and pressure of the diverted blood in other veins can affect the tissues of the calf. Symptoms can range from mild to severe and include: calf pain, discomfort, swelling, and rashes. An ulcer on the skin of the calf may develop in severe cases.

Post-thrombotic syndrome is more likely to occur if the DVT occurs in a thigh vein, or extends up into a thigh vein from a calf vein. It is also more common in people who are overweight, and in those who have had more than one DVT in the same leg.

What is the treatment for a deep vein thrombosis?

The aims of treatment are:

- To prevent the clot spreading up the vein and getting larger. This prevents the possibility of a large embolus breaking off and travelling to the lungs.
- To reduce the risk of post-thrombotic syndrome developing.
- To prevent a further DVT in the future.

Anticoagulation - preventing the clot from getting larger

Anticoagulation is often called 'thinning the blood'. However, it does not actually thin the blood. It alters certain chemicals in the blood to stop clots forming so easily. This prevents a DVT from getting larger, and prevents any new clots from forming. Warfarin is the usual anticoagulant. However, it takes a few days for warfarin tablets to work fully. Therefore, heparin injections are often used in the first few days for immediate effect. A serious embolus is rare if you start anticoagulation treatment early after a DVT.

The aim is to get the dose of warfarin just right so the blood will not clot easily, but not too much which may cause bleeding problems. You will need regular blood tests whilst you take warfarin. You need them quite often at first, but then less frequently once the correct dose is found. (If you are pregnant, regular heparin injections rather than warfarin tablets may be used.)

The length of time you will be advised to take anticoagulation for depends on various factors. For example, if you have a DVT during pregnancy or after an operation, then after the birth or when you are fit again the increased risk is much reduced and so the anticoagulation may be only for a few months. On the other hand, some people continue to have an increased risk of having a DVT in which case the anticoagulation may be long-term. Your doctor will advise.

Compression and raising the leg - to help prevent post-thrombotic syndrome

If the DVT was in a thigh vein, you may be advised to wear a compression stocking. This treatment reduces the risk of developing post-thrombotic syndrome. You should wear the stocking each day, for at least two years. (Symptoms of post-thrombotic syndrome may develop even several months or years after having a DVT, which is why you should wear the stocking long-term.)

Note: a compression stocking used following a DVT should be fitted professionally after an assessment and accurate measurement. Do not just buy 'over the counter' support stockings that may be the wrong class or size which may potentially cause more damage.

If you are advised to wear a compression stocking, you should put it on each day whilst lying in bed before getting up. Wear it for the whole day until you go to bed, or until you rest in the evening with the leg raised. Take the stocking off before going to bed. The slight pressure from the stocking helps to prevent fluid seeping into the calf tissues from the outer veins which carry the extra diverted blood following a DVT. The stocking also reduces, and may prevent, calf swelling. This in turn reduces discomfort and the risk of skin ulcers forming.

In addition, you may also be advised to do the following.

- Raise your leg when you are resting. This too reduces the pressure in the calf veins, and helps to prevent blood and fluid from 'pooling' in the calves. 'Raised' means that your foot is higher than your hip so gravity helps with blood flow returning from the calf. The easiest way to raise your leg is to recline on a sofa with your leg up on a cushion.
- Raise the foot of the bed a few inches if it is comfortable to sleep like this. This is so your foot and calf are slightly higher than your hip when you are asleep.

Preventing a first DVT - or a recurrence of a DVT

A DVT is often a 'one-off' event after a major operation. However, some people have an ongoing risk of a further DVT. For example, if you have a blood clotting problem, or continued immobility. As mentioned above, you may be advised to take anticoagulation (usually with warfarin) long-term.

Other things that may help to prevent a first or recurrent DVT include the following.

- If possible, avoid long periods of immobility such as sitting in a chair for many hours. If you are able, get up and walk around now and then. A daily brisk walk for 30-60 minutes is even better if you can do this. The aim is to stop the blood 'pooling', and to get the circulation in the legs moving. Regular exercise of the calf muscles also helps. You can do some calf exercises even when you are sitting.
- Major surgical operations are known to be a risk for a DVT - particularly operations to the hip, lower abdomen, and leg. You may be given an anticoagulant such as a heparin injection just before having an operation to help prevent a DVT. An inflatable sleeve connected to a pump to compress the legs during a long operation may also be used. It is also common practice to get you up and walking as soon as possible after an operation.
- When you travel on long plane journeys, train journeys, etc, you should have little walks up and down the aisle every now and then. Also, exercise your calf muscles every now and then whilst sitting in your seat. A separate leaflet called '*Preventing DVT When You Travel*' gives more details.

Other treatments

Sometimes other treatments may be considered. For example:

- Thrombolytic therapy (often called 'clot busting') with drugs such as streptokinase or urokinase. These drugs may help to 'dissolve' a blood clot. This is not routine treatment as it is not clear how effective it is. However, it is sometimes used in people with a severe DVT or with a large pulmonary embolus.
- Sometimes an operation is done to remove a blood clot from the leg vein or pulmonary artery. These operations are not routine and it is not clear if they are an effective treatment in most cases.
- Occasionally, an operation is done to place a 'filter' in the large vein above the blocked leg vein. The aim is to stop any blood clots from traveling up to the lungs. This may be considered if anticoagulation cannot be given (for various reasons) or if anticoagulation fails to prevent clots breaking off and traveling up into the larger veins and up to the lungs.

In summary

- The main cause of DVT is immobility - especially during surgery.
- The most serious complication of DVT is a pulmonary embolus where part of the blood clot breaks off and travels to the lung.
- Persistent calf symptoms may occur after a DVT.
- With treatment, the risk of the above two complications is much reduced.
- Treatment includes anticoagulation, compression stockings, leg elevation, and keeping active.
- Prevention is important if you have an increased risk of DVT. For example, during long operations or when you travel on long journeys.