



DVT removal and venous stenting

This leaflet explains what deep vein thrombosis (DVT) removal and venous stenting is, what happens before, during and after the procedure, and the outcomes and the risks.

It is not meant to replace informed discussion between you and your doctor but can act as a starting point for such a discussion. You should have time to discuss your situation with your own consultant or their team and the interventional radiologist (type of specialist x-ray doctor) who will be doing the procedure. You should be happy that you understand what the procedure involves before you sign the consent form.

What is DVT removal and venous stenting?

Different minimally invasive techniques, such as catheter directed thrombolysis (CDT), mechanical thrombectomy (MT) or a combination of both; pharmomechanical thrombectomy (PMT)) are used to treat DVTs by removing the blood clot(s) and inserting a stent into the vein (to correct any underlying narrowing of a vein).

Why do I need DVT removal and venous stenting?

We have identified a DVT in the veins in your pelvis (the iliac veins) or leg. These veins carry blood back from the legs to the heart. The DVT prevents blood draining from the leg causing pain, swelling and discolouration. About half of people who have had a DVT in the veins of the pelvis or upper leg end up with long term symptoms such as skin changes, discolouration, swelling, pain on walking and, in severe cases, skin breakdown and leg ulcers (in 1 in 10 - 20 patients). These changes are called post-thrombotic syndrome (PTS).

Who has suggested this procedure and who will perform it?

The consultant in charge of your care has recommended this procedure, following discussions with other specialists.

An interventional radiologist who has undergone specialist training and who regularly performs this and other similar procedures will carry out the DVT removal and venous stenting.

What is thrombolysis (CDT)?

Thrombolysis uses drugs to dissolve blood clot in a vein. Under local anaesthetic, a small tube (called a catheter) is inserted into the clot via a skin puncture either in the thigh or behind the knee (although occasionally a puncture into the groin, ankle or the neck is used). The catheter is passed into the clot and a powerful 'clot busting' drug is slowly injected directly into the clot over 1-2 days. This may be enhanced by pulses of ultrasound produced by the catheter. Hopefully this dissolves the clot, allowing blood to flow through the veins again.

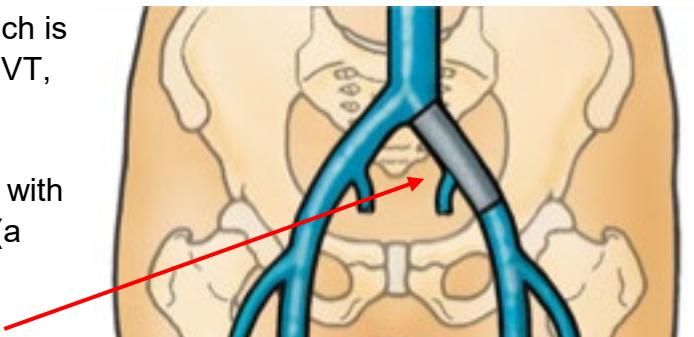
What is mechanical thrombectomy (MT)?

Thrombectomy is used to physically remove the clot using various special devices. Usually under general anaesthetic, a device is inserted into the vein via a skin puncture either in the thigh or behind the knee (although occasionally a puncture into the groin, ankle or the neck is used). The device then removes the clot usually by sucking or coring it out. Additional thrombolysis may be needed.

What is pelvic venous stenting?

Frequently, there is a narrowing in the vein which is what has caused the DVT. If you have had a DVT, it is more likely to recur unless we widen the narrowing. Therefore, after the clot has been dissolved or removed, we widen the narrowing with a balloon and then insert a flexible metal tube (a stent) to hold the vein open.

The picture shows a stent in a pelvic vein.



What are the outcomes of the procedure?

CDT, MT or PMT results in complete or almost complete clearance of the clot from the vein in 80-90% of patients, and in one study it was associated with a reduction in symptoms of post-thrombotic syndrome (PTS) from 55% to 41% (CaVENT trial). A more recent trial (ATTRACT trial) found no difference in outcome between patients treated with thrombolysis and those who were not. However, a significant proportion (43%) of the patients in this trial only had DVT in the leg (with no clot in the pelvic veins), only a few patients received stents and recruiting patients to the trial was difficult (as most suitable patients did not want to be included in the trial where there was a 50:50 chance of having CDT/PMT or anticoagulation alone) and only a few patients took part in the trial.

We think these facts explains the unimpressive results of these trials and it is difficult to apply the results of these trials to the real world.

We believe that careful selection of suitable patients and using modern techniques (including using special ultrasound scanners within the veins, a high rate of stent usage and stents specifically designed for the pelvic veins) performed by experienced operators will give better results than these trials suggest.

We will ask your permission to enter your data into a national record of these procedure (BSIR Venous Registry). This will allow us to gather information on large numbers of patients to determine real world success and complications of these procedures.

Stenting of the pelvic veins if there is a narrowing of the vein after a clot improves the chances of the vein remaining open, which is likely to improve your symptoms and reduce the risks of long term damage to the skin. We know that if the pelvic veins remain open long-term the rates of post-thrombotic syndrome fall further (from 55% to about 30%). The longer term results of stenting are not currently known, which may be of importance in younger patients.

The National Institute of Health and Care Excellence (NICE) recommends that clot removal should be offered to patients with DVT in their upper leg and pelvis.

What are the risks?

Overall the risk of a major complication is low.

- The main risk with thrombolysis is bleeding.
- While most of the 'clot busting' drug stays in the clot, some leaks into your circulation and can cause unwanted bleeding. The risk of bleeding needing either blood transfusion or another treatment is less than 2 in 100 cases.
- Bleeding can occur into the brain causing a disabling stroke in less than 1 in 200 patients. Rarely (less than 1 in 200 people) this is fatal. The risk of bleeding complication increases with age and younger patients are at lower risk.
- Minor bleeding at the puncture site or elsewhere is common and usually simple to control.
- Clot moving from the leg or pelvis into the lung (pulmonary embolism – PE) can occur with CDT, PMT or MT but is only rarely serious. A significant pulmonary embolism occurs in less than 1 in 400 patients.
- Stents may move (migrate) up the vein or even into the heart but this is very rare in this scenario especially when the stents are appropriately sized.
- Stents may in the long term become narrowed (needing widening with a balloon, usually passed down a vein from the neck or up from leg). If they become totally blocked, they can be very difficult or even impossible to re-open.
- Finally, there is a small risk of allergic reaction to x-ray dye. A severe reaction is very uncommon (less than 1 in 5000).

What are the alternatives?

Treatment with blood thinners (anticoagulation) alone, initially as injections and afterwards as tablets. This is usually for six months although some patients need it for the rest of their lives.

We know that anticoagulation medication stops the clot getting bigger or moving to the lungs but it does not clear clot from the veins, so they usually remain blocked. Symptoms can improve as other veins open up to bypass the clot.

If you decide to have CDT / MT /PMT, we will need to thin your blood in the same way for at least six months.

If the DVT is too old to treat (roughly two weeks but with newer devices possibly even 4-6 weeks) or you opted not to have DVT removal and still had severe symptoms, we could attempt to insert a stent after 12 months (when the clot has gone but the veins are left severely narrowed) but this is a much larger, more involved operation performed under general anaesthetic (GA), with lower success rates and high complication rates.

Should I proceed with CDT / PMT and venous stenting?

Some people fear the risks of the treatment and would rather manage any symptoms of post-thrombotic syndrome as and when they appear.

Other patients would rather accept the 'up-front' risks of clot removal in the knowledge that everything has been done to lower the risk of post-thrombotic syndrome.

Everyone is different and it is important you have a full and frank discussion with your treating doctors so you are happy with whatever decision you make. Unfortunately, there is no simple 'right answer' and it comes down to how you feel about the risks of the CDT / MT / PMT against the increased risk of post-thrombotic syndrome without it.

If you decide to proceed, the treatment needs to take place within a few weeks while the clot is still soft and removable.

What happens before CDT / PMT and venous stenting?

You will receive blood thinning injections (anticoagulation) to prevent the clot getting bigger.

You will have ultrasound and MRI or CT scans (to give us information about size and location of the clot) and blood tests.

You will be given this leaflet to read and you will be seen in the X-ray Department by an interventional radiologist to discuss the procedure in advance. This should help you understand the procedure, gives you an opportunity to ask questions and allows you time to consider whether you wish to proceed.

Do I need to make any special preparations?

CDT, PMT and MT and stenting is performed as an inpatient – you will be admitted to hospital.

For CDT, after the catheter is inserted in the X-ray Department, you remain in bed for the duration of the procedure, which can be several days. The catheters do not hurt, but will feel a little odd at the skin puncture site. The hardest part from your point of view will be boredom and sleep deprivation. It is useful to have some books, a tablet or laptop to keep you occupied.

For MT / PMT, it may be possible to perform the whole procedure in one session (2-3 hours) but you will still probably need to be admitted to a ward overnight. This is often done under general anaesthetic.

Please tell us if you have any allergies or have had a reaction to x-ray dye (intravenous contrast), had unexplained bleeding, a stroke or any surgery in the last six months.

To allow us to give you intravenous sedation and painkillers, **please do not eat for 6 hours but you can drink clear fluids up to 2 hours before the procedure.**

Please take all your normal medication other than those that have been stopped for the procedure.

What happens during the procedure?

On the day of the procedure you will be admitted to the Interventional Radiology Unit and asked to put on a hospital gown. A small plastic tube will be placed in your arm in case you need an injection of a painkiller or sedative.

The procedure will be performed in the Interventional Radiology Suite in the X-ray Department by an interventional radiologist (doctors with special expertise in using imaging to perform procedures through small needle holes in the skin) and the Interventional Team of nurses and radiographers.

The procedure is performed under local anaesthetic for CDT and general anaesthetic for MT/PMT. The skin over the puncture site will be cleaned – this may be at the leg, groin or neck. Local anaesthetic will be injected to numb the skin. A fine plastic tube, called a catheter, will be passed through the vein into the clot. This usually takes less than one hour.

In a small number of people, we need to insert a small metal device (IVC filter) above the clot to prevent it passing to the lungs (causing a pulmonary embolism – PE) if it breaks free during the procedure. This is usually through another small hole in a vein in the neck.

If you are having CDT, because of the risks of bleeding, you will be transferred to a high dependency unit (HMU) where staffing levels allow close monitoring. Some patients need a catheter inserted into their bladder. You will normally be in HMU for a day or two while the 'clot busting' medication is slowly pumped in.

Compression stockings and special devices called 'FlowTron boots' (see picture below) will be fitted to compress your calves regularly to ensure blood flow up the leg.

You will come back to the Interventional Radiology Suite daily to check progress.

If you are having MT /PMT, the clot will be removed in the Interventional Radiology Suite in one session of usually 2-3 hours, including stent insertion. However if MT is only

partially successful, you may need additional CDT overnight before stent insertion.

After CDT or MT or PMT has got rid of the clot, we look for a narrowing in the pelvic vein that has caused the clot. If we identify a narrowing, a balloon is inserted via the same puncture site and inflated to widen the narrowing. Once the vein is stretched up, one or more stents are inserted (also through the same puncture site) to hold the narrowing open. Inserting the stent takes about an hour.

If you have had an IVC filter inserted we will remove it, either at the same time or after a few weeks.

At the end of the procedure, someone will press on the skin over the puncture site for 10-15 minutes.

You will be given a blood thinning injection immediately after the procedure.

You will return to the ward with 'Flowtron boots' and compression stockings. You will be encouraged to get up and walk about as soon as you can. You should be either walking or in 'Flowtron boots'.

Most people go home the same day or the next day.

Will it hurt?

At the start of the procedure the local anaesthetic stings for a minute or two. The catheters do not hurt although will feel a little strange. Inflation of the balloon and insertion of the stent can be painful so you will be given powerful intravenous painkillers if the procedure is done under local anaesthetic.

What happens afterwards?

You will have twice daily anticoagulation injections until your follow-up scans (usually two weeks after the procedure) tell us we can change you to oral medication. You will need to have anticoagulation for six months, although some people may need life-long anticoagulation.

Anticoagulation is managed as an outpatient in the Royal Berkshire Hospital Anticoagulation Clinic. You will usually need to go there after we have decided to change you to oral medication.



You will be seen several times a week for 2-3 weeks so they can get the oral anticoagulation medication dose correct.

You should wear the full length compression stockings for 6 weeks. These are effective at controlling symptoms in the affected leg and we would encourage you to wear them as much as possible. Please note compression stockings are not the same as the normal stockings provided to hospital patients (TED stockings).

We will arrange ultrasound scans of the stents the day after the procedure and at two weeks, six weeks and six months.

Finally

We hope your questions should have been answered by this leaflet. An interventional radiologist will discuss it with you before the procedure and you will have the opportunity to ask questions. Please make sure you are satisfied that you have received enough information about the procedure before you agree to proceed.

Further information

If you require any further information please call the X-ray Department at the Royal Berkshire Hospital 0118 322 8368.

Diagram and photographed courtesy of The Leeds Teaching Hospitals NHS Foundation Trust.

To find out more about our Trust visit www.royalberkshire.nhs.uk

Please ask if you need this information in another language or format.

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RBFT Radiology. Author: Dr Gibson, Consultant Radiologist

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