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Patient information

Deep vein thrombosis (DVT) and pulmonary embolism (PE) advice for surgical patients

What is a deep vein thrombosis (DVT)?

A DVT is a blood clot that forms within a vein. It usually occurs within the leg but can occur elsewhere. This blocks the normal flow of blood through the leg veins either partially or completely and so causes leg swelling and tenderness. If a clot breaks off it travels to the lung and causes a pulmonary embolus (PE) which can be serious and occasionally fatal.

What is a pulmonary embolism (PE)?

A pulmonary embolism is most commonly the result of clot from the leg passing up the vein to the lung and blocking a blood vessel in the lung. This can have serious and effects including chest pain, breathlessness and potentially death. It can occur without any symptoms or signs of a DVT.

Why does a blood clot form in leg veins?

Three factors are thought to contribute to the formation of a clot within deep veins:

1. Reduced blood flow allows the blood to clot in the vein (e.g. immobility, surgery or long-distance travel over 3 hours)
2. Changes to the clotting mechanism which may be inherited, caused by some drugs or conditions such as pregnancy.
3. Damage to the lining of the vein allows the blood to clot (e.g. trauma, surgery or inflammation)

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Is DVT a serious condition?

A DVT is not a serious condition if the clot remains stuck to the vein wall before being cleared by the body's normal mechanisms to manage clots. However, it can give you other problems. Potentially serious problems include:

1. **Pulmonary embolism:** The blood clot can dislodge from the vein wall and travel to the lung causing a pulmonary embolism (PE). This can be a serious problem depending on the size of the clot. It can present with shortness of breath, rapid heartbeat, chest pain and if severe, coughing up blood or collapse. PE can be life threatening and requires urgent medical attention to reduce the risk of further complications.
2. **Post-thrombotic syndrome:** DVT can cause inflammation and permanent obstruction in the deep vein system of the leg. This complication can produce pain, swelling, discolouration and ulceration in the lower leg. This is called post-thrombotic syndrome which is a long-term problem.

Who is most at risk?

There are several factors which increase your chance of developing a DVT/PE. These include:

- Previous DVT or pulmonary embolism (PE)
- Major surgery, particularly orthopaedic operations such as joint replacement
- Major trauma / lower limb injury
- Paralysis or immobility of lower limbs including prolonged bed rest
- Family history of DVT or PE
- Faulty blood clotting, which is usually an inherited tendency to form blood clots, i.e. thrombophilia
- Active cancer and cancer chemotherapy
- Recent medical illness such as heart or lung disease, kidney disease / failure, recent heart attack, inflammation such as inflammatory bowel disease
- Smoking
- Obesity e.g. Body Mass Index (BMI) over 30
- Pregnancy and recent delivery
- Age over 60 years
- The contraceptive pill or HRT which contain oestrogen or a 3rd generation progesterone

The overall risk of a thrombosis being present after surgery ranges from 10 – 40%, depending on personal risk factors and the type of surgery. Orthopaedic surgery carries the highest risk. However, only 1% of orthopaedic cases and 0.5% of general surgical cases, present with symptoms. Small undetected clots dissolve on their own.

Is travelling a risk?

If you travel for more than three hours at one time in the four-week period before or after surgery, your risk for DVT is higher because of the immobility of your legs. After major joint replacement surgery, the risk is present for up to 90 days and particularly for long haul flights over 4 hours.

How will DVT / PE be prevented when I am in hospital?

Not all DVTs can be prevented but the risks can be significantly reduced. You will be assessed to see what preventative treatment you will need depending on your risk factors.

Preventative treatments include:

- Compression stockings for most patients
- A low dose of a blood thinning medicine (heparin, given as a small injection or tablet once a day and prescribed after discharge)
- Early mobilisation after surgery
- Bed exercises to keep the blood flow going in your legs
- Maintaining good fluid intake

How effective is the preventative treatment?

Compression stockings reduce the risk of deep vein thrombosis and of pulmonary embolism and so are used on all surgical patients except those who have poor circulation in their legs.

The use of a blood thinning agent such as a low molecular weight heparin (LMWH) injection reduces the thrombosis risk by up to 50% and risk of pulmonary embolus by up to 65%. It is used for most orthopaedic patients and some other patient groups according to the type of surgery. In some patients it will be advised that the LMWH injection is continued on discharge from hospital for up to 4 weeks after surgery.

What can I do at home?

After you are discharged you should continue to be as mobile as possible, as this improves the blood flow in the calf veins and helps prevent a thrombosis. If you have been asked to use the compression stockings, make sure they are put on evenly and without wrinkles. Stop smoking, drink plenty of water.

If you do not take the precautions that have been mentioned to you then your risk of thrombosis and its complications will be higher.

What are the symptoms of DVT?

Typical symptoms in the leg include swelling associated with pain, calf tenderness and occasionally heat and redness compared to the other leg. There may be no leg symptoms and the DVT is only diagnosed if a complication occurs in the form of a PE. There are other causes of a painful and swollen calf especially after injury or surgery so you need to ask your GP to assess you, and they may ask you to be seen urgently at the hospital if they suspect a DVT. This is via a specialist clinic.

If I get a DVT, can it be treated?

DVT is a treatable condition. The aim of treatment is to prevent the clot spreading up the vein and allow the body's natural mechanisms to slowly dissolve it and prevent the serious complication of PE.

Once a DVT has been diagnosed you will be given anticoagulant drugs to thin the blood. Traditionally the most common tablet prescribed was warfarin, which requires regular blood tests and dose adjustment for it to be effective. Whilst some people may still need to be treated with warfarin, most patients will receive newer tablets such as rivaroxaban, apixaban or dabigatran. These are easier to manage for patients and do not require regular blood tests. In some cases, treatment may mean injection therapy. This may just be for a short period at the start of your treatment or may be for the duration of your therapy. If they are needed at home, you or a family member can be taught to perform the injection, or the district nurse could come and visit you.

The duration of the treatment will depend on a variety of factors. This includes your other medical conditions and whether you have had a DVT or PE in the past. The minimum duration of treatment is three months, but it can be lifelong. You will be seen as an outpatient to discuss your treatment with a member of staff. We can discuss your specific risks of continuation and stopping treatment and then determine the duration of your treatment

West Suffolk NHS Foundation Trust is actively involved in clinical research. Your doctor, clinical team or the research and development department may contact you regarding specific clinical research studies that you might be interested in participating in. If you do not wish to be contacted for these purposes, please email info.gov@wsh.nsh.uk. This will in no way affect the care or treatment you receive.

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