Clog Up

Venous Thromboembolism (VTE) - What it is and How it Can Affect You

Mr. M is an active gentleman in his 40s and a frequent traveller from Singapore to Europe. He had just returned to Singapore via a VTL flight, when he noticed that his right leg was a bit tight and sore after the flight. However, he did not think too much of it.

The next day, he suddenly developed a sharp pain in his chest on breathing, and felt discomfort in taking deep breaths. He immediately went to the A&E department for assessment, and was discovered to have a deep vein thrombosis and pulmonary embolism (blood clots in the leg and lungs).

VTE

Venous thromboembolism (VTE) is a term which refers to blood clots developing in the veins. Veins are the blood vessels in our body which carry blood back to the heart, while arteries are the blood vessels that take blood from our heart to the rest of the body.

There are two major common forms of VTE: deep vein thrombosis (DVT) and pulmonary embolism (PE). VTEs can be a serious medical condition. If undetected and left untreated, it can be a source of significant disability, discomfort and even death.

VTE is estimated to occur in about 1 in 1,000 people in the general population. It is important to recognize that VTEs can be prevented and treated, if discovered early. This is particularly relevant as half of blood clots occur during or soon after a hospital stay or surgery.

DVT

Deep Vein Thrombosis (DVT) is a medical condition that occurs when a blood clot forms in a deep vein. This typically occurs in the lower legs, the thighs or the pelvis.

Some DVTs are actually asymptomatic and often go unnoticed. If the blood clot in the legs is small, it sometimes does not cause any major issues and gradually dissolves by itself. However, there is a small risk that the blood clot can extend and develop into a significant medical issue.

The risk of DVTs is higher in patients with ongoing medical or surgical issues. Studies have shown that taking measures to protect these patients with low doses of blood thinning medication in advance (thromboprophylaxis) can reduce the incidence of VTEs.

Common symptoms you may experience when you have a DVT include:

- Pain in the leg (usually only one side)
- Swelling of the leg
- Feeling of increased warmth in the leg
- Red or discoloured skin around the affected leg

POST-THROMBOTIC SYNDROME

Our veins have a system of valves lined along the blood vessels to regulate blood flow. When we have large blood clots, these clots can result in damage to the valves over time. One-third of patients with DVT will have long-term complications caused by the damage the clot causes to the valves in the vein. This is known as post-thrombotic syndrome (PTS). PTS can cause symptoms such as swelling, pain, discolouration, and in severe cases, may result in scaling or ulcers.

PE

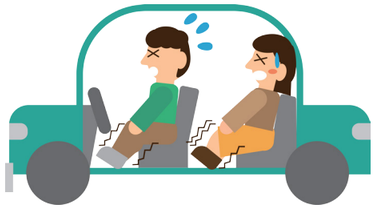
Pulmonary embolism (PE) occurs when a blood clot causes a blockage in the bloodstream to the lungs. In many cases, the blood clot originates from a DVT in the legs which has broken off and travelled to the lungs. A PE is a serious medical condition. In serious cases, it can cause sudden collapse or even death.

The symptoms of a PE may include:

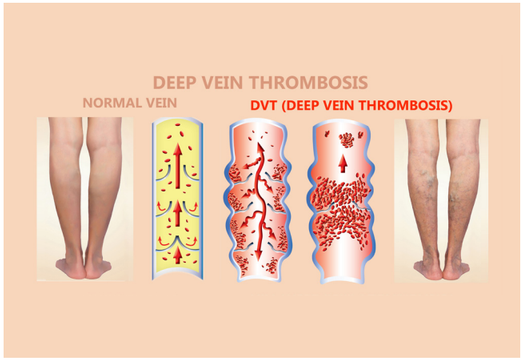
- Sudden shortness of breath
- Chest pain, particularly worsened when coughing or taking a deep breath
- Coughing up blood
- Fast heart beat
- Dizziness or sudden collapse
- Some patients will notice the symptoms of a DVT with leg discomfort beforehand

CAUSES OF VTE

VTEs can affect almost anyone. However, there are certain factors which increase the risk of developing blood clots. They include:



- **Lack of mobility:** This causes sluggish blood flow in the veins and increases the risk of blood clots. Conditions which exacerbate this include:
  - Major surgery where patients are bedridden before or after surgery
  - Orthopaedic surgery, particularly those involving the lower limbs where immobility, casts or splinting is involved
  - Acute stroke
- **Chronic medical illnesses:** These include diabetes, inflammatory bowel diseases, etc.
- **Obesity**
- **Active or recent cancer:** Active forms of certain cancers as well as the therapies for cancer are recognized to significantly increase the risk of VTE. This is a prominent cause of VTE morbidity and mortality in Asia.



- **Age:** The risk of DVT increases with age and patients above the age of 60 are at a higher risk.
- **Past history of DVT/PE:** Patients with a prior DVT are at a higher risk of subsequent VTEs. This could be due to damage caused to the veins and valves, increasing the risk of new clots. These patients could also have underlining persistent risk factors for clots which predispose them to new clots.
- **Hormone therapy:** Increased oestrogen caused by birth control pills and hormonal replacement therapy are recognized to increase the risk of blood clots.
- **Inherited clotting disorders:** There are certain genetic factors and blood clotting factors that increase the risk of blood clots. Your doctor will counsel you on whether testing for these factors are relevant to your condition.

While it has been previously reported that the risks of VTE are higher in the Caucasian population compared to the Asian population, recent studies have shown that the incidence of VTE is increasing in the Asian population. The cause of this shift is not clear. It is thought to be attributable to ageing populations in Asia, dietary changes, increasing incidence of obesity and diabetes. Cancer is also observed to be a significant cause of related-VTE in Asia.

Venous Thrombosis

DIAGNOSIS OF VTE

For DVTs, a clinical assessment is performed to assess the risk factors as well as whether the symptoms are consistent with a DVT. Other conditions, such as soft muscle injuries (sprains,

muscle tears, etc.), can mimic the presentation of a DVT. To confirm a DVT, a simple non-invasive scan (doppler ultra-scan) of the legs at the affected area to assess the blood flow in the veins is usually sufficient.

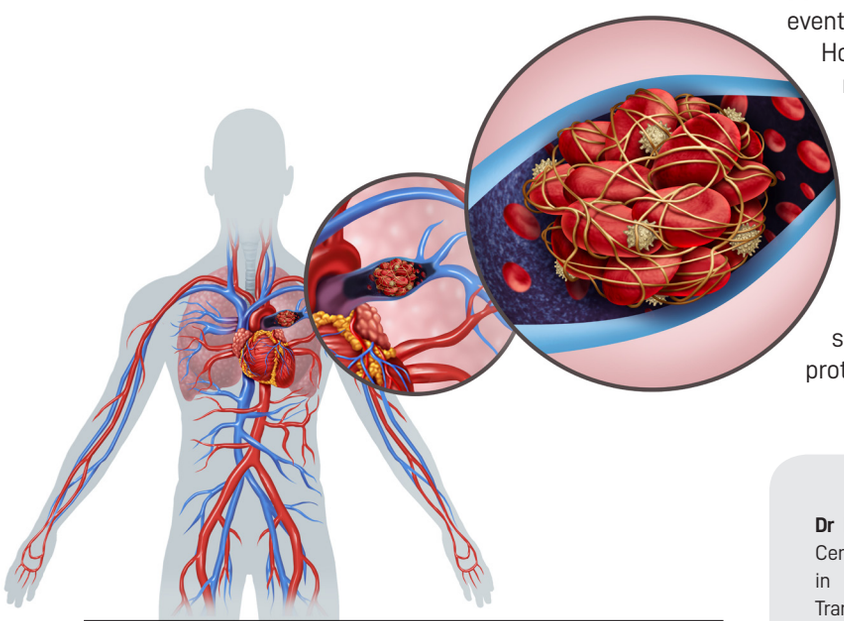
For patients with suspected PE, clinical assessment will be needed to establish the likelihood of the PE. Other medical conditions with similar features could include pneumonia (chest infection), soft muscle injury in the chest and a heart attack. Patients will have to do several tests which may include:

- **Blood test known as D-dimer:** This test tends to be elevated in patients with an acute VTE
- **Heart assessments:** In patients with a major PE, the circulation and heart will be under strain. An ECG and echocardiogram may be performed
- **Chest x-ray:** In patients where there is a high suspicion of PE, a special scan known as a CT pulmonary angiogram (CTPA) will help to determine if there has been a PE

TREATMENT FOR VTE

The treatment for VTE involves the use of blood thinners (anticoagulants). There are different forms of anticoagulants that can be used. They can be given either as an injection under the skin (subcutaneously) or as oral tablets. Your doctor will discuss the pros and cons of each form of treatment.

The duration of anticoagulation can vary from 6 weeks (for minor DVTs) to lifelong anticoagulation in patients with severe PE.



Pulmonary Embolism with a blood clot

TIPS TO PREVENT DVT

Some things that you can do to help prevent the onset of DVTs include:

- Exercise and management of weight
- Do not smoke
- Staying mobile
- If you have had surgery or been on bed rest, try to get moving as soon as possible
- If you have been sitting for a long time, do try to get up, walk and stretch around once every hour. Stay hydrated, and avoid crossing your legs as it impedes blood flow.
- If you are on a long haul flight, use pressure stockings. Stay hydrated and avoid alcohol. Just get up, stand and walk at regular intervals. If you cannot get up, then exercise and stretch your lower legs in your chair

OTHER VTE CONCERNS

- **Pregnancy and VTE:** VTE is a leading cause of complications and death in the developed world during pregnancy. In Singapore, studies have shown the most significant risk factors for VTE are smoking and pre-term delivery. Thankfully, there has been a significant reduction in local pregnancy-related VTE cases in the last decade due to risk assessment and use of thromboprophylaxis in high risk cases.

- **COVID-19 and VTE:** Severe COVID-19 is associated with an increased risk of VTE. This is especially so for patients hospitalized due to COVID-19. Severe COVID-19 associated VTE is linked to a high risk of HDU/ICU support, more prolonged admissions and higher risk of mortality. These patients are started on thromboprophylaxis early which has helped to reduce the risk of VTE.

- **COVID-19 vaccination and VTE:** More common thrombotic events do not appear to be increased in vaccinated patients. However, a rare condition has been noted in patients receiving the adenovirus based vaccines such as COVID-19 AstraZeneca vaccine. This occurs in 1 case per 100,000 exposures, and more commonly in younger individuals. Patients with this condition have a low platelet count and development of VTE in particularly unusual sites, such as the cerebral (brain) and spleen circulation. Also, it should be noted that these complications are very rare, and should not deter the public from the importance of the protective effects of vaccination. PRIME

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