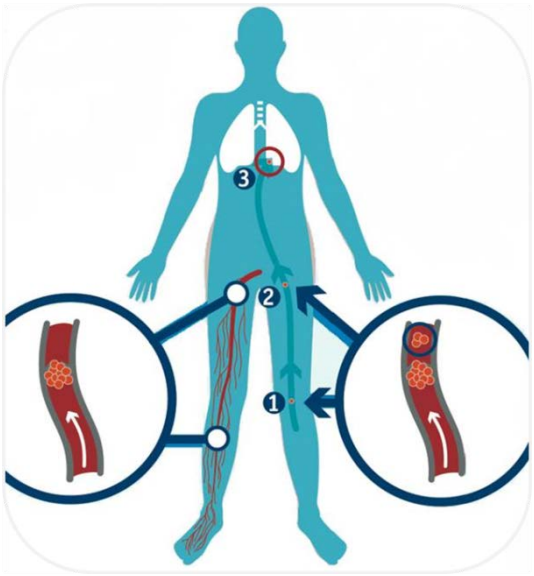
Thrombosis – Disease backgrounder

What is thrombosis?

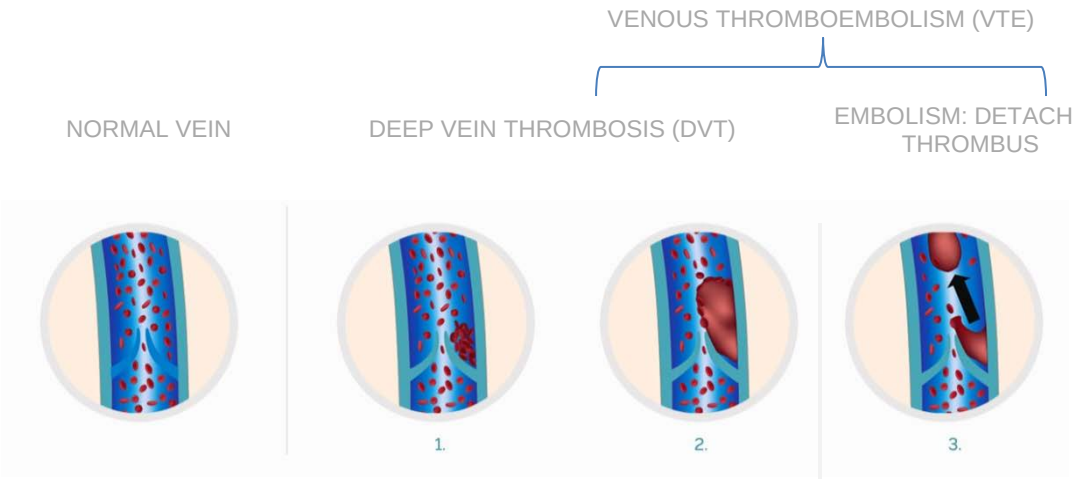
Thrombosis is the presence of a **thrombus** (blood clot) in an artery or vein. The clot, which is made up of blood cells sticking together, blocks or slows normal blood flow and can dislodge and travel to a vital organ which can be fatal.[1]

There are several types of thrombosis that can occur, depending on the location – vein or artery.



Venous thrombosis (VT) is a blood clot in a vein, for example **deep vein thrombosis (DVT)**, most common in the legs, pelvis and arms. **Venous thromboembolism (VTE)** is when a deep vein thrombosis dislodges into the circulation and travels to the lungs causing a **pulmonary embolism (PE).**[2]

Arterial thrombosis is a blood clot in an artery. For example a blood clot in an artery of the heart can cause a myocardial infarction (heart attack), while a blood clot in an artery in the brain may cause a stroke.



80% of arterial thromboembolism cases are caused by an **atrial fibrillation (AF or AFib)** related blood clot.[3] AF is a major risk factor for stroke, making a person with AF five-times more likely to suffer from it in comparison to the general population.[4] In AF, the heart does not contract as strongly as it should. This can cause blood to pool in the heart and form clots. If the blood clots dislodge, they may move to the brain, where they can become trapped in a narrow brain artery, blocking the blood flow and causing a stroke. Strokes which are related to AF have worse outcomes than non-AF related strokes.

Facts and Figures

A staggering **1 in 4 people worldwide** die from health conditions caused by **thrombosis**.[5]

Venous thromboembolism (VTE) is the third most common cardiovascular disease after acute coronary syndrome and stroke,[6] and a leading cause of death and disability worldwide. **10 million cases of VTE** occur each year worldwide. In Europe, every year 544,000 deaths are VTE related. This is the equivalent of almost 1,500 deaths each day, **more than double the number of combined deaths due to AIDS, breast cancer, prostate cancer and motor vehicle crashes combined.**[2]

Between 1 and 2 in 1000 pregnant women develop thrombosis.[7]

In the UK, 25,000 people die from VTE during hospitalisation each year,[8] while 1 in 3 people who have undergone surgery develop DVT if appropriate measures are not taken to prevent against it.[9]

From an economic standpoint, VTE poses a **significant economic burden on healthcare systems**. In the UK, VTE costs the National Health Service (NHS) €640 million per year.[2]

Causes of venous thromboembolism (VTE)

Anyone can be affected by VTE, but certain factors can increase the risk of developing it.

Risk factors include:

- **Hospitalisation**; **surgery**; **immobility** for long periods of time – even sitting with crossed legs. **60% of all VTE cases occur during or within 90 days of hospitalisation**.
- **Oestrogen based medication**, such as oral contraceptives or medication to reduce postmenopausal symptoms; pregnancy, for up to 6 weeks after giving birth;
- **Certain chronic medical illnesses**, such as heart disease, lung disease, cancer and its treatment, and inflammatory bowel disease (Crohn's disease or ulcerative colitis).[10]

Other factors that increase the risk of DVT include: personal of family history of blood clots; older age; obesity; a catheter located in a central vein; inherited clotting disorders.[10]

Smoking can increase the risk of DVT by 24%.[11]

Signs and symptoms of deep vein thrombosis[2]

DVT is often asymptomatic, unrecognized and consequently underdiagnosed and undertreated.[12] Approximately **50% of people with DVT experience no symptoms at all**.[13,14]

If present, the **most common symptoms are:**

- **pain and/or tenderness**, often in calf
- **swelling**, including the ankle and foot
- **redness or discolouration**
- **warmth** on the affected area.

PE is usually preceded by inexplicable shortness of breath; rapid breathing; sharp chest pain; increased heart rate; and light headedness.

Collectively all of the above can be symptoms of VTE.

Diagnosing deep vein thrombosis

As previously mentioned, 50% of people with DVT experience no symptoms at all. However, there are several ways of diagnosing it.

Ultrasound is the most common test for diagnosing DVT, an ultrasound uses sound waves to detect a clot and determine whether blood is flowing properly in the affected area. It may be recommended to undergo a series of ultrasounds over several days to determine if the clot is growing and to ensure that a new clot has not developed.

If the ultrasound does not provide a clear diagnosis, a **venography test** may be performed instead. A dye is injected into the affected leg and an x-ray is taken to look for blood clots.

Magnetic resonance imaging (MRI) and **computerized tomography (CT)** scans can be used to take pictures of the organs and veins and determine if a clot is present.

A **d-dimer test** measures the amount of d-dimer, a substance that is released in the blood when a blood clot breaks up or dissolves. Additional blood tests may be recommended to find out if the person has inherited a blood clotting disorder that can cause DVT.

Treatment Options

Blood thinners are the most common treatment for DVT. Although they are called blood thinners, they do not actually thin the blood. They work by decreasing the blood's ability to clot, which helps prevent an existing clot from getting bigger while the body slowly reabsorbs it, and helps stop new clots from forming.

It is important to know that blood thinners do not break up or dissolve existing clots, and they may not resolve DVT symptoms. Some patients may be candidates for interventional treatments that can help clear the clot, potentially relieving the symptoms of DVT and reducing the risk of long-term complications such as post-thrombotic syndrome (PTS).

If the patient is contraindicated to blood thinners, the doctor may use **venous filters** as an alternative treatment. A filter is inserted using a catheter into a large vein called the Inferior Vena Cava. This is the main vein that takes blood from the lower body to the heart. While the small metal filter will not stop new clots from forming, it is intended to catch blood clots and stop them from entering the lungs and causing a pulmonary embolism, a serious and potentially deadly complication of DVT.

To help relieve leg pain and swelling, **compression stockings** may also be used for up to two or more years after being diagnosed with DVT. Also known as graduated compression stockings, these specialized stockings are tighter at the ankle and gradually become looser higher up the legs. They work by gently squeezing the legs to improve blood flow.

IV clot busters, or thrombolytics, are medications placed directly into the clot during a minimally invasive procedure. They are designed to quickly dissolve clots, restore blood flow, and may help prevent damage to the valves in the vein, which can cause PTS.

Mechanical thrombectomy devices are special catheters designed to help break up and physically remove all or portions of the blood clot during a minimally invasive procedure. A mechanical thrombectomy

procedure can help to quickly restore blood flow, reduce the amount and duration of drug therapy, and may help prevent damage to the valves in the vein, which can cause PTS.

Prevention

Despite the significant prevalence of thrombosis worldwide, global **awareness of thrombosis remains remarkably low**. It is important to understand the main associated risk factors, to conduct VTE risk assessments and be able to recognise the signs and symptoms. Understanding how to prevent against it will reduce the prevalence of thrombosis.

If immobile for extended periods of time, such as **following surgery, illness or injury, it is important to start moving again as soon as possible**.

When sitting for long periods of time, for example during long haul flights or trips longer than four hours, **it is essential to get up and walk around every two or three hours, to exercise the legs as much as possible and to wear loose-fitting clothes**.

Even simple exercises like raising and lowering the heels while keeping the toes on the floor, and vice versa, or tightening and releasing the leg muscles will help.

Risk can also be reduced by **maintaining a healthy weight, avoiding a sedentary lifestyle, and following doctors' recommendations**.

Media contacts

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