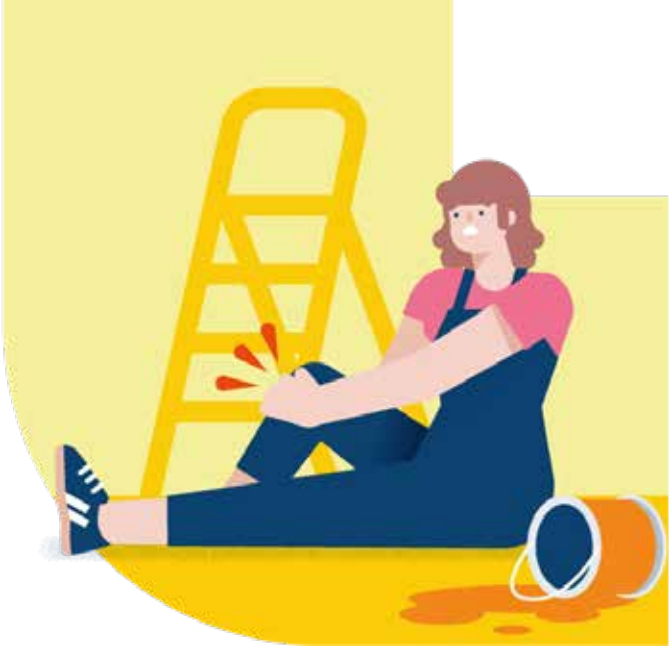
TiLLI
Thromboprophylaxis in Lower Limb Immobilisation

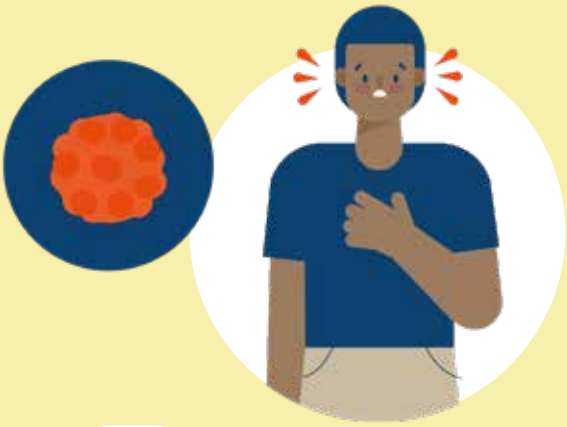


PREVENTING BLOOD CLOTS during Lower Limb immobilisation

Treatment of a leg injury that requires immobilisation in a rigid plaster cast, removable boot or temporary splint increases the risk of developing blood clots in the deep veins of the leg. This condition is known as Deep Vein Thrombosis (DVT).

Is a DVT serious?

A DVT may cause local symptoms in the leg, such as pain and swelling, but can be serious if it results in a pulmonary embolism (PE). A PE occurs when some or all of the leg clots dislodge from the deep veins and travel up the larger veins to the heart and lungs. The symptoms of a PE commonly include chest pain and breathlessness. If a PE is very large, it can cause dizziness, collapse or even sudden death. The combination of DVT and/or PE is called **venous thromboembolism** or **VTE**. In the long-term, VTE can result in changes to the affected leg such as chronic swelling and ulceration and/or persistent shortness of breath.



What is the risk of VTE with lower limb immobilisation?

VTE occurs in around 2 to 3% of people who require lower limb immobilisation after leg injury, and usually happens within the first few weeks.[1] Your personal risk is dependent on a combination of factors including your age, weight, past medical history or any family history of blood clots. Other factors are related to the severity and type of injury you have suffered and the type of immobilisation your injury requires. Your treating team will ask you questions and, based on published research, will rate your risk of VTE as high or low.

How will you help me reduce my VTE risk?

Your treating team will manage your injury so that you can start walking on your injured leg as soon as it is safe to do so. This will help stimulate the calf muscles to pump blood actively through the leg veins, reducing the risk of blood clots. They may also suggest some regular exercises while your leg is immobilised, such as wiggling the toes or intermittently moving the ankle.

In addition, if your team think you are at high risk of blood clots, they may offer you medications to thin the blood, known as 'anticoagulants' or 'blood thinners'. If you take these regularly as prescribed while your leg is immobilised, it will help reduce your overall risk of blood clots by about 50%.[2,3]

What can I do to help reduce my risk?

- Make sure you keep as mobile as possible during your period of immobilisation. If your calf muscles contract then they will squeeze the deep veins and help push blood up your leg, reducing your risk of blood clots forming. Talk to your clinical team about what leg exercises you can do and how often they should be performed.
- Since the risk of blood clots increases with dehydration, please drink plenty of fluids to keep well hydrated.
- Make sure you take any medication prescribed for the full duration to prevent VTE until you can walk without issue on your injured leg, or unless otherwise advised by your team.

What things should I look out for while my leg is immobilised?

You should seek urgent medical advice from your treating team or attend your local emergency department if you develop any of the following symptoms during your period of lower limb immobilisation:

- New or increasing pain in the leg muscles that is getting worse or not settling with painkillers.
- Unexplained swelling of the injured leg or changes in skin colour.
- New chest pain, especially if the pain is worse on breathing in.
- New shortness of breath, either on mild exercise or at rest.
- New unexplained light-headedness or collapsing episodes, with or without loss of consciousness.
- Coughing up blood.

If I need 'blood thinning' medications what will be prescribed to reduce the risk of VTE?

Different hospitals will use different medications, as there is currently no good research to tell us which option is better. Make sure you tell the team looking after you if you are already taking blood thinning medication at any dose for another condition, or you take any other medications regularly. If blood thinning medications are still appropriate, you will be offered one of the following options:

1. Low Molecular Weight Heparin (LMWH) injections

There are three main types of LMWH used in this situation and all have a similar effect. They are: enoxaparin, dalteparin and tinzaparin. These medications can only be given by injection, usually into the tummy or thigh areas, and are usually prescribed once or twice a day. These injections are easy to administer under the skin and you (and/or a family member) will be taught how to do this. You will be provided with a special bin for safe disposal of any needles. Please be aware that LMWH injections are often derived from animal (pig origin). Discuss this with your treating team if this is a concern to you.

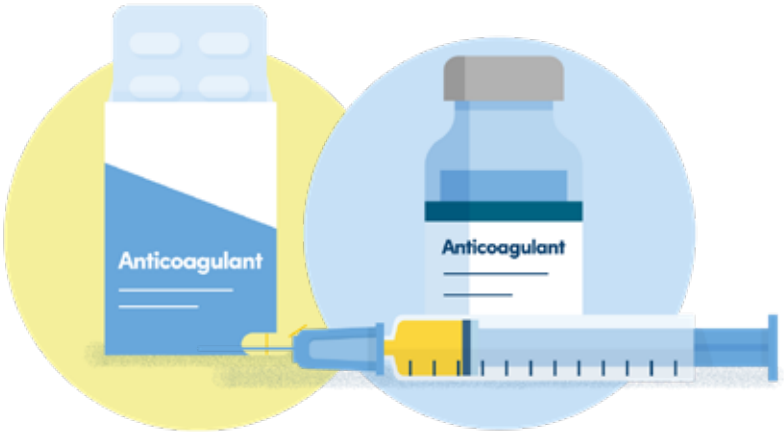
2. Fondaparinux injections

This medication has a similar effect as LMWH but is synthetic, (no animal derivatives). It is by injection in the same way.

3. Direct Oral AntiCoagulant (DOAC) tablets

These blood thinning medications can be swallowed as tablets. There are two DOAC medication types in use for this indication, named rivaroxaban and apixaban. The two options have equal effect but rivaroxaban is taken once a day and apixaban is taken twice a day. The DOAC medications cannot be used during pregnancy or breastfeeding and should not be prescribed to women who are currently trying to get pregnant. They should also not be prescribed in some types of kidney and/or liver failure.

All medications can have potential interactions with other medicines. There are also several conditions where the use of blood thinners is not advised. Your treating team will ask you some questions about your medical history and may perform some blood tests before prescribing blood thinners, to ensure it is safe for you to use them. Your treating team will also provide clear instructions on how and when to take the any medication prescribed. In general, you should start your medication within 24 hours of your leg first being immobilised. The medication should be taken every day, ideally at the same time, until you can walk easily on your leg or your treating team ask you to stop. It is important to always carry your medical anticoagulation alert card with you; you will find this inside the anticoagulant box.



Are there any circumstances where I should stop taking my medication early?

If your treating team recommend an operation for the treatment of your injury, you will be advised to stop blood thinning medication before surgery. Make sure you take your dose as normal the day before surgery, unless you are told otherwise by your medical team. Most people will just miss their blood thinner on the morning they are due to have surgery and restart later that day, usually around 6 hours after the operation has been completed. Your surgical team will advise you on exactly when to restart your medication after surgery and how long you should carry on taking it.

Do these medications have any side-effects?

All blood thinning medications carry a small increased risk of bleeding. It is unlikely that you will have any other sideeffects from this treatment. If you experience any of the following symptoms, you should stop taking the medication and contact a medical professional urgently:

- Blood in your bowel motions or urine.
- Coughing or vomiting blood.
- Heavy or persistent nose bleeds.
- Heavier periods that make you feel unwell.
- Unexplained visible bruising.

Bruising at the site of injections is common and expected. Please show a nurse or doctor your bruises if they are very big, or are worrying you.

Who should I contact for advice if I have questions or concerns?

If you have a question about your injury or plaster/ splint, you should contact the team looking after you at your local fracture clinic. If you have minor symptoms or simple questions about your medication, or if you forget to take a dose of your anticoagulant, you can speak to your local healthcare professional for advice. There is also lots of advice and further information (including videos and booklets) about blood clots, including information about anticoagulants, frequently asked questions and what to do if you miss a dose on the Thrombosis UK website: www.thrombosisuk.org or download the free app, 'Let's talk clots'.

Are there any opportunities to participate in research on this topic?

The Thromboprophylaxis in Lower Limb Immobilisation (TiLLI) study is comparing strategies to prevent blood clots in people with leg injuries and will be running until 2029. More details are available at thrombosisuk.org. Ask your treating team for further information if you are interested in participating and want to know more; the trial has patient information videos, leaflets and other resources available in different languages.

If you have more serious symptoms

like intense leg pain, chest pain, shortness of breath or heavy bleeding, you should urgently attend your local emergency department for rapid assessment.

References:

1. Pandor A, Horner D, Davis S, Goodacre S, Stevens JW, Clowes M, et al. Different strategies for pharmacological thromboprophylaxis for lower-limb immobilisation after injury: systematic review and economic evaluation. Health Technol Assess 2019;23:1-190. https://doi.org/10.3310/hta23630

2. Douillet D, Chapelle C, Ollier E, Mismetti P, Roy PM, Laporte S. Prevention of venous thromboembolic events in patients with lower leg immobilization after trauma: Systematic review and network meta-analysis with meta-epsidemiological approach. PLoS Med 2022;19:e1004059. https://doi.org/10.1371/journal.pmed.1004059

3. Horner D, Stevens JW, Pandor A, Nokes T, Keenan J, de Wit K, et al. Pharmacological thromboprophylaxis to prevent venous thromboembolism in patients with temporary lower limb immobilization after injury: systematic review and network meta-analysis. J Thromb Haemost 2020;18:422-38. https://doi.org/10.1111/jth.14666

TiLLI Thromboprophylaxis in Lower Limb Immobilisation

Thrombosis UK
Awareness • Research • Care