This leaflet is intended for patients undergoing knee replacement surgery to help increase understanding and awareness of the risks posed by blood clot formation in the deep veins of the leg. To learn more, please contact Anticoagulation Europe by phone on +4420 8289 6875, or visit us online at www.anticoagulationeurope.org.
This is Rosa. She is 46 years old and has arthritis. She injured her knee jogging 10 years ago and had surgery to repair a torn shock absorber in the knee.¹

She has stopped running and since has been unable to control her weight. The cushioning between the joint has worn away and the extra weight has put a lot of stress on her knee. Her movement is restricted and she is struggling with pain control. She is the mother of two teenage children and can’t cycle with them or run them around in the car anymore.

Rosa needs to have a knee replacement and has heard that one particular risk can cause problems after surgery...
This risk is from blood clots. But... What are they really? And... What is she at risk of?

Rosa knows from childhood that if you fall and graze your knee, any bleeding normally stops quickly. A blood clot or scab plugs the hole to stop the bleeding and let the body rebuild the damaged area.²

She is worried about her knee replacement because she knows that removing the worn out parts involves making a deep wound.

The Nurse—Maria—answers these questions when she goes to the clinic.
Nurse Maria explains that the kind of blood clot or scab seen on the knee is a natural and essential function that also occurs inside the body when it is injured. Special substances in the blood make it sticky to slow down bleeding.³

Special substances also make the cells in the blood clump together (known as ‘clotting’) to provide a natural ‘safety net’ that plugs holes, thereby stopping blood from escaping.³
It is important to get the right amount of clotting, in the right place and at the right time. After surgery, blood clots can form inside a vein. If a clot blocks the vein, this causes a problem.

The nurse goes on to describe how...
Blood vessels are used constantly to transport the essential things the body uses, such as oxygen, to where they are needed. Blood vessels are also used to move things that the body has finished with (such as carbon dioxide, ammonia and waste products created by metabolism) so that they can be disposed of.⁴

These functions are vital to life.
Surgery upsets the body’s natural balance for clotting. After a big operation, the body is on full alert and stands guard, ready to prevent blood loss by making clots if you start to bleed. The special substances that make blood sticky are released while the body is in this protective state.\(^5\)

All of the time that the body is working to stop any bleeding, it is pumping blood around the blood vessels making sure that organs such as the brain and heart are getting enough oxygen to keep them healthy.
When you rest in bed following surgery, the blood flow in the legs becomes sluggish, as these muscles are not being used.

When we are being active, the leg muscles help to pump blood back up to the heart. When your muscles contract, they exert a squeezing force on the blood vessels that they surround, thereby moving the blood along (imagine trying to get the last bit of toothpaste out of the tube).

If the legs are not used for a long time, it is possible for pools of blood to build up in the veins.
If blood pools in the legs when it is sticky, clots can develop even though they are not needed. This happens because the blood is not being moved around enough, thereby giving it a chance to clump together.\textsuperscript{6}

When a blood clot develops in a vein in the leg it is called a \textit{deep vein thrombosis}. It can cause swelling so that one leg looks bigger than the other. It may also feel warmer or may become painful.\textsuperscript{7,8}

However, it is also important to bear in mind that some people may not experience any symptoms.
When you start to walk around again, the unwanted clots may become dislodged and get washed away to another part of the body.
If the unwanted clots get washed away to your lungs, this causes a **pulmonary embolism**. In a pulmonary embolism, the clot reduces the blood flow through the lungs, meaning fewer red blood cells can collect oxygen to deliver around the body. If not treated quickly, a pulmonary embolism can be fatal.
Unwanted blood clots can be prevented from forming in the first place by a medicine called an anticoagulant.

This is given to you by your hospital doctor. It helps your body to slow down the clotting process.¹⁰
Some people are more at risk of developing blood clots than others. As such, it is very important that you have a discussion with your doctor before your operation to let them assess your own level of risk and prescribe the best treatment. After your operation, you should have a second risk assessment.

If you have not been made aware of having this risk assessment, it is essential that you ask for it.
Following her operation, Rosa was given exercises to help to pump the blood around her legs, as well as anticoagulant medication. She is looking forward to an improved life.

The danger from unwanted blood clots can last for several weeks after your operation. It is very important that any anticoagulant medicine be taken daily for as long as your doctor tells you.
References:

1. Based on National Joint Register 8th Annual Report statistical data showing that over 90% of hip and knee replacements in the UK are for osteoarthritis http://www.njrcentre.org.uk/njrcentre/default.aspx.


Notes:
Remember...

Blood clots—if you are not told about this risk, ask your doctor whether he or she has done a risk assessment before your surgery and ask again afterwards.

Please take your medicine for as long as your doctor asks you to.

Call your doctor immediately if you do get any of the following symptoms:⁹

- Shortness of breath
- Blood spots on a tissue or in your mouth when you cough
- Chest or shoulder pain
- Dizziness or fainting
- Lower leg pain, swelling, redness or heat compared to the opposite leg

Name: ____________________________________________

Hospital: _________________________________________

Hospital Doctor’s name and contact details:

__________________________________________________

General Practitioner’s name and contact details:

__________________________________________________

THIS PERSON IS TAKING __________________________MEDICATION.
IN CASE OF ANY PROBLEMS, PLEASE CONTACT HIS OR HER DOCTOR AT THE NUMBER LISTED ABOVE.