

Trouble down deep

EACH YEAR, ABOUT 20,000 AUSTRALIANS DEVELOP DEEP VEIN THROMBOSIS. WHILE DEBATE ABOUT THE RISK POSED BY LONG-HAUL FLIGHTS GOES ON, THE MAJOR RISK FACTORS LIE ELSEWHERE, WRITES LISA MITCHELL

Studies examining a potential link between DVT and plane travel are often contradictory, but most seem to agree that after six hours of immobility, the risk of developing the problem is increased. This would also apply to long car, train or bus trips.

Tania is hardly one to visit her GP with sniffles and proclaim a bout of flu, which also explains why putting up with having to spend a whole Friday limping about at work wasn't out of character. Later at the medical centre, the 26-year-old office administrator from Sydney was surprised to find her ankle and calf so swollen. She had been too busy at work to think about checking the throbbing behind her knee and aching that engulfed her calf.

"A couple of months before, I had a weird pain in my right leg and I knew I'd never felt that particular pain before," she says. "It didn't feel like a strain. I had no explanation for it. I think it was building in my leg for a while. First it was down the back of my leg close to the ankle, but it would go away. Then it went up the back of my leg a little higher. The week before it got really bad, I saw a doctor who suspected it was a superficial clot. He told me to come back in a couple of weeks if it wasn't better, to do an ultrasound."

By Friday, however, she could not ignore the pain. Tania booked in for an ultrasound the next day, and the result confirmed deep vein thrombosis (DVT), a blood clot (thrombus) in her right leg. By Sunday night, she was having difficulty breathing. I couldn't sleep, it felt like a stitch up my side. I wasn't gasping for air or anything but it was very uncomfortable."

On the Monday, a lung scan revealed a pulmonary embolus, a clot blocking a blood vessel in her lung. With DVT, part of a clot, usually one above the knee, can break away and travel to the lung, creating a potentially life-threatening

situation. Tania was whisked to a hospital bed, with an intravenous dose of blood-thinning heparin for company. A week later, another ultrasound revealed the extent of her condition - she had a series of clots stretching from mid-thigh to mid-calf.

DVT develops mostly in the deep veins of the legs but can also occur in deep veins of the arm or pelvis. Diagnosis is usually by ultrasound or X-ray. Each year, about 20,000 Australians will develop DVT, says Brisbane haematologist Dr Beverley Rowbotham - that's roughly one person per thousand people per year. Of those, about 400 will die from complications such as pulmonary embolism. Over the age of 60, the risk of developing DVT escalates to one in 100 people.

"And an elderly person can die from pulmonary embolism (more easily than a younger person) because half their lung may be already gone from heart disease or smoking. A tiny clot can kill them," says Dr Rowbotham who is also Vice President of RCPA.

Once formed, clots can take months, even years, to disappear, and the telltale swelling may never entirely abate. The standard treatments in DVT cases are blood-thinning drugs such as heparin and warfarin, which do not reduce the clot but prevent more from forming. Only in the most severe cases would surgeons operate to remove a thrombus. The current thinking is that the body's normal processes will dissolve it in time.

An unfortunate legacy of DVT is often damaged valves in the veins, meaning the blood pools in the lower leg instead of flowing back upwards. This is

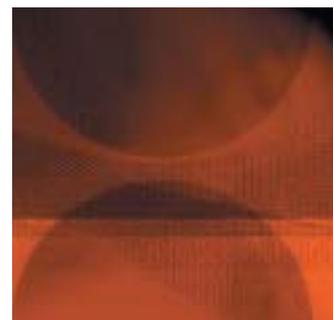
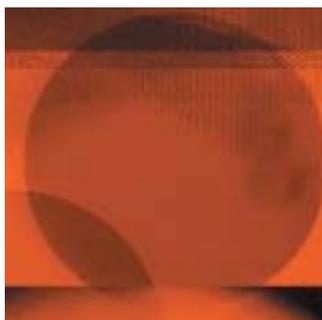


*Dr Bev Rowbotham
Vice President, RCPA*

called post-thrombotic syndrome, and there are no cures for it yet, says Dr Rowbotham. "The valve is incredible, so fine, it's almost like GladWrap. We don't have anything subtle enough to repair it yet."

So what causes DVT? The recent media frenzy surrounding it would have us believe that long-haul flights are the major culprit but that is not the case. According to an Australian Department of Health and Ageing study, funded by the Department of Transport and Regional Services, DVT would occur for an average middle-aged traveller once in 40,000 flights, with a death occurring about once in 2 million flights.

Dr Rowbotham says studies examining a potential link between DVT and plane travel are often contradictory, but most seem to agree that after six hours of immobility, the risk of developing the problem is increased. This would also apply to long car, train or bus trips. In damage control, the airlines have rallied to detach DVT from their wings.



Qantas, for example, runs an in-flight workout video on domestic and international flights and publishes an exercise regimen in its inflight magazine. Through the International Air Transport Association, airlines are also working with the World Health Organisation and International Civil Aviation Organisation on studies to determine whether there is a link between DVT and air travel.

Dr Rowbotham says DVT occurs mostly when a combination of risk factors are present. Adding to the risk are age, obesity, recent surgery or trauma, immobility, pregnancy, the contraceptive pill, hormone replacement therapy (HRT), cancer, a previous incidence of DVT and an inherited clotting tendency known as thrombophilia.

Within Dr Rowbotham's caseload, age is the most common factor, followed by surgical patients, cancer patients and pregnant women. No Boeing 747s listed there. Abnormal inherited clotting tendencies can be tested for. There are four such conditions that affect the clotting mechanisms in our blood: antithrombin III, protein C deficiency, protein S deficiency, and Factor V Leiden. Most were discovered as recently as 15 years ago.

"Blood clotting is highly regulated," Dr Rowbotham says. "It is essential to have a very active clotting mechanism to stop bleeding, because we're clotting all day, every day, as we bump into things, but it is just as important that clotting be turned off when it is no longer needed. Patients who have inherited one of these conditions cannot turn clotting off. They

have a malfunction in their anticlotting, or anticoagulant, mechanism."

Those with any of the first three conditions are deficient in the proteins that inactivate the clotting factors, but with Factor V Leiden, the proteins work fine, it is the clotting factor, Factor V, which is abnormal and resistant to inactivation. Standard laboratory tests are performed on a blood sample and the results are turned around in a week. A Medicare rebate is available if the person being tested has had DVT or if they have a first-degree relative who is known to have one of the inherited disorders. The timing of tests is important, however.

"These are best done after the thrombosis has settled, because if you do them during the acute event all your clotting factors are usually being used up by the DVT, so you get misleading results," Dr Rowbotham says. "It's better to wait until you're off the warfarin, which can be six months after initial treatment. The Factor V Leiden test can be done at any time, because it's a genetic test, but the other three relate to the protein levels in your blood."

The value of such blood tests says Dr Rowbotham, is that they give us a better understanding of our risk factors and allow us to manage them and reduce the likelihood of developing DVT.

"In the old days, nobody tried to prevent DVT (in high-risk patients), but it's standard practice now. You might have a bit of heparin before your surgery and a foot pump on the table (to pump blood through legs paralysed during surgery). These days you're up and out of bed straight after surgery, and the

incidence of DVT has declined dramatically."

About 4 per cent of the population has Factor V Leiden, but many of these people will never have DVT. The other three conditions are quite uncommon. It was thought that these disorders would account for many DVTs, but only about 20 per cent of people with DVTs have them. "If you have Factor V Leiden, your risk factor (of developing DVT) goes up to eightfold; if you're on the pill, multiply that by four, or for HRT, multiply by two," Dr Rowbotham says.

At the time of diagnosis, Tania had been on the pill for eight years. Her blood tests later revealed she also has two copies of the Factor V Leiden abnormality, which means she has a higher risk of developing DVT than those with one copy of the gene. Her condition has settled, but she must take warfarin daily for at least six months. She doesn't yet know if the valves in her legs are permanently damaged, and six weeks later, the swelling remains. One thing is certain, she must steer clear of synthetic hormones for good – the pill and HRT are out - and if she decides to have children, her condition will be monitored very carefully.

"You could have pain in your legs for so many reasons," says Tania. "It just goes to show, you really have to ask for an ultrasound or things to be done. It's the only way to put your mind at ease." 🔥

GPs NOTE: This article is available for patients at <http://pathway.rcpa.edu.au>

DIAGNOSIS

Symptoms of deep vein thrombosis (DVT) include **swelling of the leg, warmth and redness of the leg** and **pain** that is noticeable, or worse, when standing. Less than 5 per cent of people with DVT may also develop pulmonary embolism (PE), a dislodged clot that blocks a blood vessel in the lung. Symptoms of PE include **shortness of breath, chest pain** and **coughing up phlegm flecked with blood**. After the taking of a full medical history to determine risk factors, the following tests are used to diagnose DVT:

- An **ultrasound scan**.
- A **venography scan** – an X-ray that shows the flow of blood when a special dye is injected into the veins, and/or magnetic resonance imaging (MRI) scan.
- A **ventilation-perfusion lung scan** – to check for pulmonary embolism only.
- A **D-dimer blood test** that checks for a building unit of a blood clot. If present in increased amounts, this indicates that blood clotting has taken place somewhere in the body.

TREATMENT

Treatment is aimed at preventing the clot becoming larger, new clots forming, breakaway clots travelling to the lungs and post-thrombotic syndrome (damaged valves in the veins). Usual treatment includes:

- **Heparin** – a **blood-thinning agent**, or anticoagulant, delivered intravenously in hospital or by subcutaneous (under the skin) self-injection at home, depending on the severity of the case, two to three times a day initially.
- **Warfarin** – an **oral anticoagulant** taken daily, generally for three to six months.
- **Surgery** – rarely used, only for the removal of extremely large clots.
- Continuing **blood tests** to monitor and adjust the anticoagulant medication.
- **Compression stockings** – assist blood flow and stop blood from pooling when legs are immobile for long periods of time, and worn extensively by DVT patients with damaged valves.

PREVENTION

- A series of **blood tests** to check for the inherited anti-clotting abnormalities antithrombin III, protein C deficiency, protein S deficiency and Factor V Leiden helps patients (and their relatives) to identify and manage their DVT risk factors.