

Post-thrombotic syndrome

Reviewed by SickKids Hospital Staff | Last updated: September 25th 2017

Post-thrombotic syndrome occurs when deep-vein thrombosis damages the vein valves and walls. Learn the signs and symptoms and how it's treated.

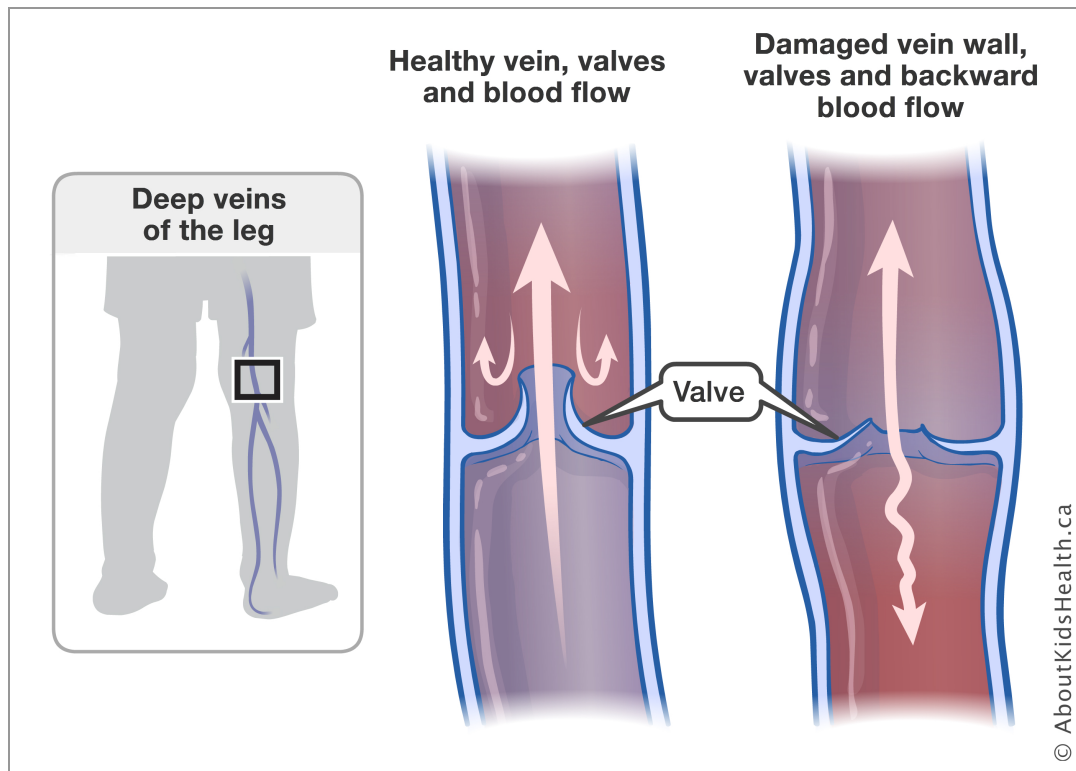
Key points

- Post-thrombotic syndrome (PTS) occurs when deep vein thrombosis (DVT) damages the vein valves and vein walls, causing swelling, pain and other symptoms.
- Approximately 1 in 3 children will develop PTS up to 10 years after having DVT.
- The main risk factors for developing PTS in children are left over blood clot after DVT treatment, and age.
- Use of elastic compression garments can help relieve PTS symptoms.

Post-thrombotic syndrome (PTS) is the most common long-term complication of [deep vein thrombosis \(DVT\)](#). PTS occurs when DVT damages the vein valves and vein walls. Valves are found throughout the veins and help prevent backward blood flow, away from the heart. When a valve is damaged and altered in shape, blood backs up, pooling in the affected limb, which increases blood pressure in the veins. Damaged veins cannot expand and contract as easily as healthy veins. When blood flow increases through the damaged veins, for example during exercise, they cannot bring blood back to the heart as easily as normal veins.

This results in swelling and pain in the limb that had the DVT.

Blood flow through healthy versus damaged vein



Healthy veins have valves that prevent backward blood flow, away from the heart. When a valve is damaged and altered in shape, blood backs up, pooling in the affected limb, which increases blood pressure in the veins.

Approximately 1 in 3 children develop PTS up to 10 years after having DVT. However, severe PTS is rare, occurring in fewer than 5% of patients. Children with severe PTS have more frequent or intense symptoms, and, in extremely rare occasions, ulcers on the skin.

Signs and symptoms of PTS

Pain and swelling in the affected limb are the most common symptoms in PTS. Other symptoms of PTS include:

- Paraesthesia (pins and needles) in the affected limb
- Heaviness
- Tightness
- Tired limb
- Skin redness, or purple or blotchy skin
- Limited endurance (ability to keep up with an activity with the arm or leg affected by the clot)
- Visible veins on the skin

In very rare and serious cases, your child may also have skin ulcers.

Symptoms tend to worsen with intense physical activity, and prolonged standing or sitting. Symptoms will usually improve with lying down and rest.

Risk factors for PTS

There are two potential risk factors for PTS in children:

- Left over clot after treatment may increase the risk of developing PTS.
- Older children seem to be at higher risk of developing PTS.

Additionally, obesity may be another risk factor for the development of PTS.

Not every patient who has had a DVT will develop PTS. Others may develop PTS, even though they may not appear to be at risk. Hence, being seen by a pediatric expert in blood clots is important to diagnose this condition.

Diagnosis of PTS

Diagnosis of PTS is clinical, based on the signs and symptoms on the leg or arm affected by the blood clot. In clinic, you or your child will complete a questionnaire asking about PTS symptoms, and then your child's doctor will examine your child to see if PTS is present.

Sometimes, it can be difficult to tell the difference between a new blood clot, and PTS. In both cases the affected limb may become red, very swollen and/or painful again. With PTS, however, symptoms tend to be subtler (or less pronounced) than the symptoms of a new blood clot. It may also be difficult to differentiate the symptoms of PTS from normal growing pains in the legs. Symptoms of PTS tend to worsen during the day, particularly with the use of the affected limb (e.g. after a long walk), and improve with rest. In some cases your doctor may need to request another ultrasound to check if there is a new clot.

Treatment of PTS

Depending on the symptoms your child has, doctors may prescribe [elastic compression garments](#) to improve circulation in the affected limb. Using elastic compression garments daily can help relieve PTS symptoms. Elevating the affected limb helps reduce swelling by assisting the return of blood back towards the heart. While resting, it is good to elevate the feet above the heart and while sitting, one should rest their feet on a stool.

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