

# ■ Blood Clots (Thrombotic Disorders) ■

Problems related to abnormal blood clots are rare in healthy children. However, children with certain diseases or injuries are at risk of developing blood clots, causing complications related to reduced blood flow. Some of these complications are very serious, including strokes, which may cause damage to the brain. Several inherited diseases also can cause abnormal blood clotting. Children who are at risk of complications related to abnormal clotting may need anticoagulant (blood-thinning) medications.

## What kinds of problems can be caused by blood clots?

Blood clotting is the normal process in which blood cells stick together to stop bleeding. When abnormal blood clots develop, they may result in serious complications. The clot may block or severely reduce blood flow to an organ, such as the brain or kidney; or to one of the limbs, usually the leg.

Problems resulting from clots within a blood vessel are called “thrombotic disorders.” Other problems occur when a clot breaks free and moves through the blood vessels (“thromboembolic disorder”). Both types are rare in healthy children. However, they can occur in children with many types of illnesses or injuries, or in children with medical monitoring equipment in place. Other children have inherited conditions causing abnormal blood clotting.

Thrombotic disorders can cause many complications, including strokes when a clot blocks the blood flow to the brain. If your child has a blood-clotting abnormality, anticoagulant medications (sometimes called blood thinners) can help to reduce the risk of serious complications. Your child needs close medical follow-up while taking these drugs.

## What are the conditions causing blood clots, and what do they look like?

*Inherited clotting disorders.* These are genetic (inherited) problems with one of the substances (proteins) controlling the clotting system in our blood.

- Infants with some genetic blood-clotting abnormalities develop serious complications soon after birth. Depending on the severity of the disorder, these complications can be fatal if they are not treated promptly.
- If the clotting disorder is less severe, it may lead to clot-related complications later in childhood, or even in adult-

hood. For example, girls with certain clotting disorders may not experience problems until they become pregnant or start taking birth-control pills.

*Acquired clotting disorders.* A number of diseases and conditions can lead to problems with blood clots. Some examples are:

- Tissue injury from trauma, burns, or other causes. Severe injury to the brain or other organs damages the blood vessels, causing clots.
- Severe infections.
- “Indwelling” catheters. Clots can occur with devices, such as intravenous (IV) tubes that are placed in the patient's blood vessels for monitoring and treatment during an illness.
- Cancers.

The *signs* and *symptoms* of clotting disorders vary, depending on where the clot is located—whether it is in an artery (vessel taking oxygen-containing blood from the heart) or vein (vessel carrying blood back to the heart and lungs to obtain oxygen), and how badly it is interfering with the blood supply to an organ or body part.

- For example, a clot in the artery supplying a limb will cause the limb to be cold and pale, with no pulse. If the clot is in a vein, the limb will be swollen and painful.

## What increases your child's risk of abnormal blood clots?

- If you or others in your family have any genetic disease causing abnormal blood clotting, your child may be at higher risk. Genetic counseling may help you to understand this risk.
- Many different medical conditions and certain medical procedures can lead to blood clots.

## How are abnormal blood clots treated?

For some clots, no treatment is necessary.

*Thrombolytic drugs.* These drugs may be used to help dissolve abnormal clots and restore blood flow to the affected organ or body part.

- Thrombolytic therapy is only helpful if the clot is relatively recent: less than 3 to 5 days old.
- This type of treatment is most effective when the thrombolytic drug can be delivered right to the site of the clot.

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- Thrombolytic therapy may be used for clots blocking the blood flow to the lungs, a blocked leg vein, or a blocked catheter. These medications are used less often in children. Close monitoring in the hospital is needed both during and after the attempt at thrombolytic therapy.

*Anticoagulant therapy.* Anticoagulant drugs, or blood thinners, decrease the blood's ability to form clots. This gives the body a chance to dissolve clots and prevents new clots from occurring.

- If your child's increased risk of clots is likely to be only a temporary problem (for example, after an infection or injury), anticoagulants may be used for only a short time. If the increase in clot risk is related to a genetic disease or other permanent condition, long-term anticoagulant therapy may be needed.
- The two main types of anticoagulant drugs are heparin and warfarin, although other medications such as aspirin are used for certain conditions. While taking any anticoagulant drug, your child will need close medical monitoring. There can be an increase in the risk of bleeding complications from their use. Your doctor will let you know what monitoring tests are needed and how often they should be done.
- *Many factors can affect your child's level of anticoagulation.* For example, if your child is taking warfarin, the blood-thinning effect may be affected by various medica-

tions. Aspirin, antibiotics, laxatives, vitamin E, and other medications may increase the anticoagulant effect, increasing the risk of bleeding. Other medications, such as vitamin K and birth control pills, may decrease the anticoagulant effect, thereby increasing the risk of clots.

- *Even minor bleeding can lead to problems if your child is taking anticoagulants.* During treatment, your child will have to avoid some sports and other activities. Make sure to inform your dentist and any other health care professionals that your child is taking anticoagulant medications and is at risk of bleeding complications. Special preparations may be needed before dental and medical procedures, especially surgery. Teachers and the school nurse should be informed as well.
- Your doctor will also tell you what to do if your child has an episode of bleeding while taking anticoagulants. For example, for patients taking warfarin, vitamin K can be used to treat bleeding problems.

### **When should I call your office?**

During anticoagulant treatment, your doctor will give you specific instructions on monitoring, prevention of complications, and what to do in case of an emergency. Get medical help immediately if your child develops symptoms of either blood-clotting problems or excessive bleeding.