CONDITION

# Congenital fibrinogen deficiency

Congenital fibrinogen deficiency is an inherited condition causing too little of a blood protein needed to form stable clots.

**WHAT IT IS**
Inherited shortage of the clotting protein fibrinogen

**BODY SYSTEM**
Blood and circulation

**MAIN SYMPTOMS**
Easy bruising, prolonged bleeding, nosebleeds, heavy periods

**WHAT CAUSES IT**
Inherited changes affecting fibrinogen production

**HOW IT IS DIAGNOSED**
Functional fibrinogen, antigen testing, and sometimes genetic testing

**MAIN TREATMENT**
Fibrinogen replacement and specialist bleeding care

**CAN IT BE CURED?**
No - the inherited defect remains lifelong

**IS IT AN EMERGENCY?**
Sometimes - severe, internal, or uncontrolled bleeding

**LONG-TERM OUTLOOK**
Often manageable, with ongoing bleeding and clotting risks

## Overview

Congenital fibrinogen deficiency is an inherited condition in which the body makes too little fibrinogen. Fibrinogen is a protein produced by the liver and carried in the blood. During clotting, it is changed into strands of fibrin, which strengthen the blood clot and help stop bleeding.

The amount of fibrinogen can be reduced or almost completely absent. A complete or near-complete lack is called congenital afibrinogenemia. A partial shortage is called congenital hypofibrinogenemia. People with a lower level do not always have milder symptoms, although severe deficiency generally carries a greater bleeding risk.

Some inherited fibrinogen conditions affect how the protein works rather than how much is present. This is called dysfibrinogenemia. It can overlap with a low fibrinogen level, but it is not

the same as a straightforward deficiency. Laboratory tests help distinguish these conditions.

Bleeding may begin in infancy, or the condition may not be found until later in life. It may become apparent after an injury, dental procedure, operation, menstrual bleeding, pregnancy, or childbirth.

Although this is mainly a bleeding condition, some people can also develop unwanted blood clots. For this reason, treatment and monitoring are usually coordinated through a specialist bleeding disorders or hematology service.

## Symptoms

Symptoms differ according to the fibrinogen level, how well any fibrinogen present works, and other personal factors. Some people with a partial deficiency have few symptoms.

Possible bleeding symptoms include:

In babies with severe deficiency, continued bleeding from the umbilical cord stump may be an early sign. Bleeding after circumcision, injections, or other procedures may also lead to testing.

Bleeding into a joint can cause pain, warmth, swelling, and reduced movement. Repeated bleeding into the same joint may gradually damage it.

Internal bleeding is less common but can be serious. It may occur in the abdomen, chest, or brain, sometimes after an injury and sometimes without an obvious trigger.

Unexpectedly, congenital fibrinogen disorders can also be associated with thrombosis. Thrombosis means a blood clot forming inside a blood vessel. It can happen with or without previous fibrinogen replacement treatment. Symptoms depend on where the clot forms.

- Easy or unexplained bruising
- Frequent or prolonged nosebleeds
- Bleeding from the gums or mouth
- Bleeding that continues after cuts, dental work, or surgery
- Heavy or prolonged menstrual bleeding
- Bleeding into muscles or joints
- Bleeding in the digestive or urinary tract
- Excessive bleeding during or after childbirth

## Causes and risk factors

Congenital fibrinogen deficiency is caused by inherited changes in the FGA , FGB , or FGG gene. These genes provide instructions for making the three parts of the fibrinogen protein.

Severe afibrinogenemia usually follows an autosomal recessive inheritance pattern. This means a person has inherited a disease-causing gene change from each parent. The parents are usually carriers and may have no symptoms.

Some partial deficiencies follow autosomal dominant inheritance. In this pattern, one altered copy of a gene can be enough to cause a low fibrinogen level. The inheritance pattern can therefore differ among families.

Having a close relative with a confirmed fibrinogen disorder increases the chance of carrying the same genetic change. However, the condition can be diagnosed in someone without a previously known family history. Relatives may have mild symptoms, or the genetic change may not have been identified before.

Congenital deficiency is different from an acquired low fibrinogen level. Fibrinogen can fall because of severe liver disease, major bleeding, widespread clotting activation, or other illnesses. Medical assessment and testing are needed to determine the cause.

## Diagnosis

Diagnosis starts with your bleeding history, family history, physical examination, and blood tests. Tell the clinical team about heavy periods, previous operations, dental bleeding, pregnancy complications, and any personal or family history of blood clots.

Initial clotting tests may include prothrombin time and activated partial thromboplastin time. These measure how long different parts of the clotting process take. They may be very prolonged when fibrinogen is absent, but they do not identify the exact disorder by themselves.

More specific testing includes:

Comparing fibrinogen activity with the amount of fibrinogen protein helps distinguish a true shortage from a protein that is present but does not work normally.

Tests may be repeated to confirm an unexpected result. Other causes of a low fibrinogen level also need to be considered. Genetic testing can confirm an inherited cause in many cases and may help with family testing, but it is not always needed before urgent treatment.

- Functional fibrinogen testing: measures how well fibrinogen forms a clot

- Fibrinogen antigen testing: measures the amount of fibrinogen protein present
- Thrombin time: measures the final stage in which fibrin is formed
- Genetic testing: looks for a change in a fibrinogen gene

## Treatment and management

Treatment is tailored to the severity of the deficiency, your bleeding history, and the situation. Care is usually planned with a hematologist who has experience in rare bleeding conditions.

Fibrinogen replacement is the main treatment for significant bleeding. It may also be used before surgery, invasive procedures, or childbirth. Fibrinogen concentrate is a purified blood product that raises the fibrinogen level. The amount and timing are based on blood test results, body weight, the site of bleeding, and the procedure involved.

If fibrinogen concentrate is unavailable, cryoprecipitate or fresh frozen plasma may sometimes be used. These are plasma-derived blood products containing fibrinogen and other proteins. They have different volumes and fibrinogen concentrations, so they require clinical monitoring.

Some people with severe deficiency or repeated serious bleeding receive regular preventive replacement. This is called prophylaxis. It is not needed by everyone, and the possible benefit must be balanced against treatment burden and clotting risk.

Other management may include:

Because thrombosis is possible, fibrinogen replacement is monitored carefully. Treatment for a blood clot can be difficult when a person also has a bleeding condition. Decisions about anticoagulants like warfarin or apixaban , which reduce clot formation, require specialist oversight.

Pregnancy and childbirth need advance planning with hematology and obstetric teams. Fibrinogen plays a role in maintaining pregnancy as well as controlling bleeding. Replacement may be needed during pregnancy, delivery, or the period after birth, based on individual risk and test results.

Before dental work or surgery, tell the treating team about the condition well in advance. A written plan can cover laboratory testing, replacement treatment, bleeding control, and follow-up.

- Medicines that help protect clots from breaking down, especially for some mouth, nose, or menstrual bleeding
- Hormonal treatment to reduce heavy menstrual bleeding

- Iron replacement if ongoing blood loss causes iron deficiency
- Physical rehabilitation after muscle or joint bleeding
- Specialist treatment if a blood clot develops

## Complications

Severe or repeated bleeding can lead to iron-deficiency anemia. This may cause tiredness, weakness, headaches, or shortness of breath during activity.

Repeated joint bleeding can damage cartilage and other joint structures. Over time, this may cause long-term pain, stiffness, and reduced movement. Muscle bleeding can also press on nerves or blood vessels.

Bleeding in the brain, abdomen, chest, or other internal organs can be life-threatening. Prompt assessment reduces the risk of lasting harm.

Pregnancy complications may include miscarriage, placental bleeding, separation of the placenta from the womb, and heavy bleeding during or after delivery. These risks are not the same for everyone, but early specialist planning is important.

Blood clots are another possible complication. A clot in a deep leg vein can cause swelling, pain, or warmth. A clot that travels to the lungs can cause sudden breathlessness or chest pain. Rarely, clots can affect arteries or other veins.

Replacement products may cause allergic or infusion reactions. As with other plasma-derived treatments, products are manufactured and screened to reduce infection risks. Your treatment team can explain the product being used and how it is monitored.

## Prevention

The inherited gene changes that cause congenital fibrinogen deficiency cannot currently be prevented.

Genetic counselling can help you understand how the condition may be passed through a family. It may include discussion of carrier testing, testing for relatives, and reproductive options. These are personal choices, and counselling provides information rather than directing a decision.

Complications can sometimes be reduced through planned care. Useful steps include having a treatment plan before surgery or dental work, attending specialist follow-up, and seeking advice early during pregnancy.

Avoid starting medicines that can increase bleeding, including aspirin or anti-inflammatory pain medicines, without checking whether they are suitable for you. Do not stop a prescribed medicine without medical advice.

## Living with it and what to expect

Congenital fibrinogen deficiency is lifelong because the underlying genetic change does not go away. Your fibrinogen level often remains within a similar range, but symptoms and treatment needs can change with injuries, menstruation, pregnancy, surgery, illness, and age.

People with partial deficiency may go for long periods without bleeding. Others need treatment around procedures or after injuries. People with severe deficiency may require more frequent monitoring and, in some cases, preventive replacement.

Regular follow-up usually reviews bleeding episodes, blood clots, treatment use, iron levels, joint health, and upcoming procedures. A personal care plan is useful because this condition is rare and may not be familiar to every healthcare professional.

Consider carrying a medical alert card or wearing medical identification. Keep details of the diagnosis, usual treatment, specialist centre, and emergency contact information available. If replacement treatment is stored at home, follow the product's storage instructions.

Physical activity supports fitness, muscle strength, and joint health. The safest type of activity depends on your bleeding history. Lower-impact exercise may be preferred if you have repeated joint or muscle bleeding. A specialist physiotherapist can help if pain or previous bleeding affects movement.

Children can usually attend school and take part in suitable activities. Their school or childcare setting should have a clear plan explaining what to do after an injury and when to contact family or emergency services.

Most people can work, travel, form relationships, and have families. Planning is especially important for travel, operations, pregnancy, and activities with a high injury risk. The long-term course cannot be predicted exactly, but coordinated specialist care helps many people manage the condition over years.

## When to get medical help

Arrange routine contact with your hematology or primary care team if you have:

Seek urgent medical assessment for bleeding that does not stop with your usual first-aid or

treatment plan, a suspected deep muscle bleed, blood in vomit or stool, or new painful swelling in a leg.

Call emergency services for:

Do not wait for visible bruising after a serious injury. Internal bleeding may not be obvious at first.

- More frequent bruising, nosebleeds, or gum bleeding
- Heavier or longer menstrual bleeding
- New tiredness or other possible signs of anemia
- Repeated pain or swelling in a joint
- An upcoming operation, dental procedure, or invasive test
- Plans for pregnancy or a confirmed pregnancy
- Questions about medicines, exercise, work, or travel
- A significant head injury or sudden severe headache
- Confusion, weakness, fainting, seizure, or difficulty speaking
- Sudden shortness of breath, chest pain, or coughing blood
- Severe abdominal pain, swelling, dizziness, or collapse
- Heavy, uncontrolled bleeding
- Bleeding during pregnancy with significant pain, weakness, or faintness

## Common questions

Is congenital fibrinogen deficiency the same as hemophilia?

No. Both are inherited bleeding conditions, but they involve different clotting proteins. Hemophilia usually involves factor VIII or factor IX. Congenital fibrinogen deficiency affects fibrinogen, the protein used to build and strengthen the final clot.

Can a low fibrinogen level return to normal?

The inherited deficiency usually remains lifelong. Replacement treatment can raise the level temporarily, but it does not correct the underlying genetic change. A low level caused by another illness may improve if that cause is treated.

Can I exercise with congenital fibrinogen deficiency?

Many people can exercise. Suitable activities depend on your bleeding history, joint health, and

severity of deficiency. Activities with a high risk of collision, falls, or head injury may need extra planning or may not be suitable for some people.

Can I have a healthy pregnancy?

Pregnancy is possible, but fibrinogen deficiency can increase the risk of miscarriage, placental problems, and bleeding. Early care from both a specialist obstetric team and a hematology team allows monitoring and a planned approach to replacement treatment and delivery.

Does fibrinogen replacement cause blood clots?

It can contribute to clotting risk, although clots may also occur as part of the underlying condition. Treatment is therefore based on symptoms, test results, and the clinical situation rather than raising fibrinogen without monitoring.

Will my children inherit it?

That depends on the genetic change and its inheritance pattern. Severe afibrinogenemia is commonly autosomal recessive, while some partial deficiencies are autosomal dominant. Genetic testing and counselling can clarify the chance for your family.

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