NATIONAL HEMOPHILIA FOUNDATION

for all bleeding disorders

GLANZMANN'S THROMBASTHENIA (GT)

YOU ARE NOT ALONE

Glanzmann's Thrombasthenia (GT)

WHAT YOU SHOULD KNOW

Whether you are newly diagnosed with **Glanzmann's Thrombasthenia (GT)** or have been diagnosed for some time, it is common to go through many ups and downs. We want to share information that you should know and some resources about this condition that can help you on your path to improved health and quality of life. When you are first given a new diagnosis, one as rare as GT, it is understandable to have many emotions or feel overwhelmed. The good thing is that you're not alone.

There are other people who have the same condition and lead full lives. They have had their lives enriched by becoming closer to other people who are traveling on a similar path. **With the care of an experienced team, you will find support from your health-care providers as well as from the vibrant and caring bleeding disorders community.** You can be involved in this community and build meaningful relationships with your new extended family.

"There are other people who have the same condition and lead full lives. They have had their lives enriched by becoming closer to other people who are traveling on a similar path."

The National Hemophilia Foundation (NHF) is here to provide you with education and support as you manage your bleeding disorder whether you are a child, a teen, a woman, or an adult. In this spirit, NHF and the bleeding disorder community have selected some of the most frequently asked questions and answers below to empower you.

What Is Glanzmann's Thrombasthenia?

Glanzmann's Thrombasthenia (GT) is an ultra-rare inherited bleeding disorder centered around platelet function. Bleeding disorders are a group of medical conditions that share an inability or a decreased ability to form a stable blood clot. When the body is injured and an area bleeds, a clot is formed to stop the bleeding. Clot formation is a multistep process and is called coagulation. When the blood clots properly, the blood clot is held together firmly at the site of the injury. People with a bleeding disorder are unable to make strong clots. Improper clotting can be caused by abnormalities in blood components such as platelets and/or blood clotting proteins, also called clotting factors. Platelets are small blood cells that help blood clot. Platelets act like first responders and stop bleeding by clumping and forming plugs in injured blood vessels. If any of the blood components is defective, deficient, or even absent, blood clotting is affected. **The defect that causes GT makes the platelets unable to function properly. They no longer stick together like they are supposed to because of a defect in a protein on the platelet surface. There is either a decreased amount of the protein or a decreased activity of the protein. GT usually occurs in approximately 1 in 1,000,000 indiviuduals.**[1]

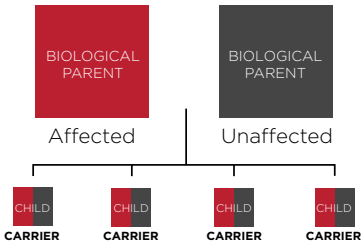
"Clot formation is a multistep process and is called coagulation. When the blood clots properly, the blood clot is held together firmly at the site of the injury."

How does someone get Glanzmann's Thrombasthenia?

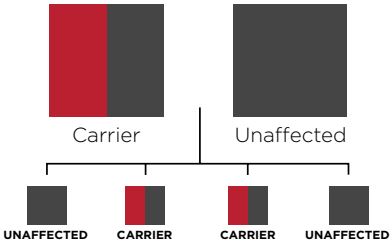
GT is an inherited bleeding disorder, meaning that it is passed on from biological parents to child at the time of conception. It is caused by a change (mutation) in the DNA sequence (a gene located on chromosome 17) that instructs the production of a protein that is important for the platelet function called integrin αIIbβ3 (previously known as glycoprotein IIb or IIIa).[2]

- It affects both males and females equally.
- The affected person has two abnormal copies of a mutated gene.
- A carrier has only one copy of a mutated gene. Typically, carriers do not have bleeding symptoms.
- For someone to inherit GT they must get a copy of the defective gene from both biological parents. That means both biological parents must be affected or are carriers of GT.
- This pattern of inheritance is called Autosomal Recessive. It is different from what is called X-linked inheritance, as in the case of some other bleeding disorders like hemophilia. The different forms of autosomal recessive inheritance are illustrated on the next page.

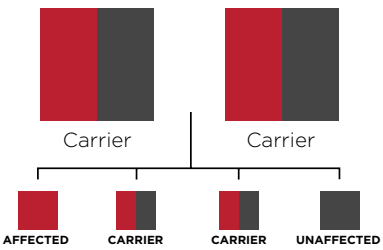
Family Inheritance of an Autosomal Recessive Disorder



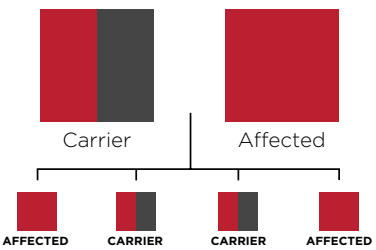
All children will be carriers (**100%**)



1 in 2 chance of being a carrier (**50%**)
1 in 2 chance of being unaffected (**50%**)



1 in 4 chance of being affected (**25%**)
1 in 2 chance of being a carrier (**50%**)
1 in 4 chance of being unaffected (**25%**)



1 in 2 chance of being a carrier (**50%**)
1 in 2 chance of being affected (**50%**)

SUMMARY

If you are **AFFECTED** with GT, you probably got one mutated gene from each of your biological parents.

If you are a **CARRIER** of GT, you received only one copy of a mutated gene from a biological parent.

You can use the same logic to figure out the likelihood of your children being impacted by the deficiency, depending on your and your partner's genes. Genetic testing and counseling are available if you are interested in figuring out where the deficiency came from, or who else in the family might be at risk of having the same condition.

What are the symptoms of Glanzmann's Thrombasthenia?

There are three types of GT. **The severity of the bleeding disorder is unpredictable and has little relationship with the type of GT you have.** The bleeding symptoms are usually confined to those who are affected (have two copies of the defective gene). Those who have only one copy of the defective gene (carriers) may not have any bleeding symptoms. If you are a carrier and experience bleeding symptoms, it is important to seek medical care from a hematologist (blood doctor). Typically, persons with GT develop symptoms early in life, usually in childhood. Bleeding can occur in many places, be minor or life threatening, and should not be ignored.

Symptoms can range from mild to severe, and include the following:[3]

- **easy bruising**
- **nose bleeds** (epistaxis)
- **heavy menstrual bleeding**
- **bleeding during or after childbirth**
- **excessive bleeding during or following surgery**
- **bleeding from the stomach or intestines** (gastrointestinal bleeding, often seen as blood in the stool)
- **dental bleeding**
- **collection of blood under the skin causing bad bruises** (hematomas)

How is Glanzmann's Thrombasthenia diagnosed?

The first step towards the diagnosis of GT is to get a detailed history of bleeds or disorders from both you (the patient) and your family.

If the history is consistent with a bleeding disorder, the starting point is drawing your blood, and sending your blood sample to get tested in a lab. If these screening tests are all normal, then your physician may proceed with further evaluations to rule out other bleeding disorders, such as von Willebrand disease. If this workup is normal and symptoms are consistent with a platelet dysfunction (there are many types of platelet dysfunction), additional testing may be ordered.[3]

Specialized tests (platelet aggregation and secretion studies or platelet flow cytometry) are performed to diagnose a person with GT. These platelet tests are very sensitive and many things can alter their results, such as medications, foods, and smoking.

You need to work closely with a hematologist or Hemophilia Treatment Center (HTC) for appropriate tests and medical advice. They will provide you or your family member with instructions prior to testing.

How is Glanzmann's Thrombasthenia treated?

For optimal care, it is recommended that you find a specialized doctor, or hematologist (blood doctor), who is experienced in the treatment of GT. These doctors often work at a "Hemophilia Treatment Center" or HTC.

Managing bleeding in persons with GT is often difficult. A range of treatments may be used. For minor symptoms, topical therapies (put on the skin) and/or antifibrinolytics (pills or liquid that help the clot you make last longer) may be enough to control bleeding.

Receiving normal platelets in an infusion (in a vein) is the standard treatment to control or prevent more significant bleeding in persons with GT. However, such platelet transfusion may not always be available.[4] Over time, getting other peoples' platelets may cause your body to make antibodies against the infused platelets keeping them from working to stop the bleeding.[1] To lessen the chance of this happening, your doctor may try to find donated platelets with markers that match your platelets.

In 2014, activated recombinant factor seven (rFVIIa) was approved for the treatment of bleeding episodes and surgical treatment in adults and children with GT with a decreased or missing response to platelet transfusions. Your healthcare provider or HTC will work with you to develop a treatment plan based on your bleeding history and response to medications.[5]

Current research in gene therapy for persons with GT is underway and very exciting. If you are interested in this form of treatment, you should ask your HTC hematologist for more information.

What special precautions need to be taken when considering pregnancy?

Pregnancy in women with GT is possible but presents challenges as there is an increased risk to both the mother and baby. Bleeding during or after delivery in GT is common and may be severe.

A meeting with your hematologist is essential prior to getting pregnant. It is important to work closely with a hematologist who is experienced in the treatment of GT. Often these specialized doctors are found at a Hemophilia Treatment Center (HTC). They can guide your women's health doctor (OB/GYN) to help develop a treatment plan during your pregnancy, labor and delivery, and up to 4-6 weeks after delivery (the postpartum period).

Women with GT should have a high-risk OB/GYN physician on their team when they are pregnant. HTC hematologists will also be able to provide care to your baby and provide testing as needed.[6]

"A meeting with your hematologist (blood doctor) is essential prior to getting pregnant."

ADVICE FROM OTHER GT COMMUNITY MEMBERS

> GT is not given to those who deserve it, it's given to those who can handle it. We are strong, capable, and relentless."
>
> **GT Patient**

> Live your life to the fullest, do, and participate in what you love. Your bleeding disorder does not define you. Most importantly, be your own advocate for your health; you understand your condition and body more than anybody else!"
>
> **GT Patient**

> Having Glanzmann's Thrombasthenia doesn't mean that your child is any different. Your child is unique in his/her own way. Allow them to participate in the things they love, in fact encourage them to do so. However, take precautions and make sure your child knows what his/her disorder means so they can avoid getting hurt."
>
> **Parent of a Child with GT**

Where else can I obtain additional information?

You are now part of a family known as the bleeding disorders community. You are not alone, and you can turn to other members of this community for support if needed:

- Know how to navigate disclosing your or your child's bleeding disorder to daycare, school, or work.
- Learn more about advocating for appropriate treatment in an emergency room (ER) or with other healthcare providers who may not know much about GT.
- Find out where to connect with others living with bleeding disorders locally.

Resources:

The National Hemophilia Foundation

- **Glanzmanns Thrombasthenia webpage:** https://www.hemophilia.org/bleeding-disorders-a-z/types/inherited-platelet-disorders
- **Educational Resources:** https://stepsforliving.hemophilia.org/
- **HemAware magazine:** https://hemaware.org/
- **HANDI toll-free hotline:** 1-800-42-HANDI

Foundation for Women & Girls with Blood Disorders

- **Website directory of specialty women's clinics:** https://www.fwgbd.org/clinics

Hemophilia Federation of America

- **The Learning Central:** https://www.hemophiliafed.org/the-institute/

The National Institute of Health

- **Genetic and Rare Diseases Information Center:** https://rarediseases.info.nih.gov/diseases/2478/glanzmann-thrombasthenia

Mayo Clinic

- **Autosomal Recessive Inheritance Pattern:** https://www.mayoclinic.org/autosomal-recessive-inheritance-pattern/img-20007457

(NORD) National Organization for Rare Disorders

- **Rare Disease Database:** https://rarediseases.org/rare-diseases/glanzmann-thrombasthenia/

(CHES) Comprehensive Health Education Services

- **Website**: www.ches.education/rare-bleeding-disorders

Glanzmann's Research Foundation, Inc

- **Website:** www.curegt.org

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3. Lambert, MP. What to do when you suspect an inherited platelet disorder. Hematology American Society of Hematology Educational Program. 2011, 377-383.
4. Poon, Man-Chiu. The use of recombinant activated factor VII in patients with Glanzmann's thrombasthenia. Thrombosis and Haemostasis. November 2020.
5. Rajpurkar, M. et al. Use of recombinant activated factor VII in patients with Glanzmann's thrombasthenia: a review of the literature. Haemophilia. 2014, 464-471.
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This booklet is intended for informational purposes only. It is not intended to be used to make healthcare coverage or treatment determinations. NHF's Medical and Scientific Advisory Council (MASAC) recommends that the product and corresponding treatment regimen used by an individual should remain a decision between patient and physician.

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