NATIONAL HEMOPHILIA FOUNDATION
for all bleeding disorders

FACTOR VII (F7) DEFICIENCY

YOU ARE NOT ALONE

Factor VII Deficiency

WHAT YOU SHOULD KNOW

Whether you are newly diagnosed with **Factor VII Deficiency (FVII Deficiency)** 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 FVII Deficiency, 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 healthcare 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, or an adult. In this spirit, NHF and the bleeding disorders community have selected some of the most frequently asked questions and answers below to empower you.

What Is Factor VII Deficiency?

FVII Deficiency is the most common of the ultra-rare bleeding disorders. Bleeding disorders are a group of medical conditions that share an inability or 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 multi-step process called coagulation. When the blood clots properly, the blood clot is held together firmly at the site of the injury to prevent ongoing blood loss. **People with a bleeding disorder are unable to make strong clots to prevent ongoing bleeding.** 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 normally. Platelets act like first responders and stop bleeding by clumping and forming plugs in blood vessel injuries. If any of the blood components is defective or deficient or even absent, blood clotting is affected. FVII is one of the clotting factors that is an important part of this process and works by making the clot strong or stable. **FVII Deficiency is caused by an abnormal function or decreased amount of the FVII protein. It is a bleeding disorder where you may be missing all your FVII or have lower than a normal level in your body.**

"Bleeding disorders are a group of medical conditions that share an inability or decreased ability to form a stable blood clot."

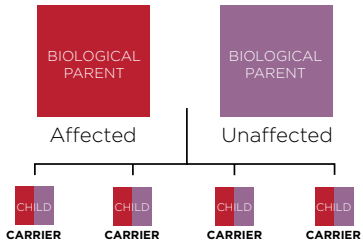
People who do not have this bleeding disorder will have a FVII level of greater than 50% on a laboratory test. People affected with FVII Deficiency have less than 50% FVII circulating in their blood stream.[1] Your doctor can tell you what your FVII level is. FVII Deficiency affects approximately 1 in 500,000 individuals.[2] It is also known as Proconvertin or Alexander's Disease.[2]

How does someone get Factor VII Deficiency?

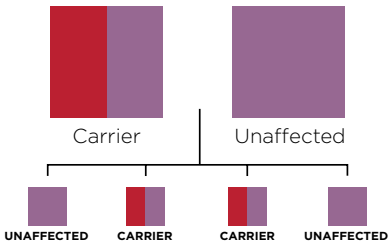
FVII Deficiency is an inherited bleeding disorder, meaning that it is passed on from biological parents to child at the time of conception.

- It affects both males and females equally.
- The affected person has two abnormal copies of a defective gene.
- A carrier has only one copy of a defective gene. Typically, carriers do not have bleeding symptoms.
- For someone to inherit severe FVII Deficiency 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 FVII Deficiency.
- 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.

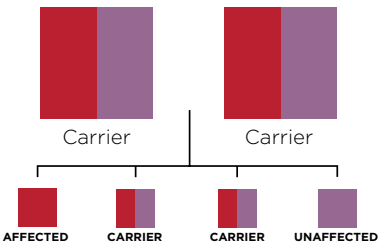
Family Inheritance of an Autosomal Recessive Disorder



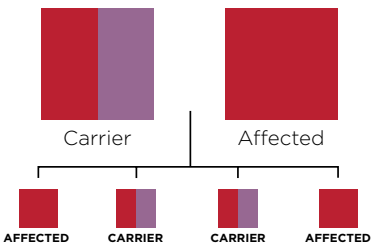
All children will be carriers (**100%**)



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



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



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

SUMMARY

If you are **AFFECTED** with severe Factor VII Deficiency, you probably got one defective gene from each of your biological parents.

If you are a **CARRIER** of Factor VII Deficiency, you received only one copy of a defective 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.

Sometimes a person might develop FVII Deficiency, rather than being born with it. Such an "acquired deficiency" is still quite rare. It is usually caused by an antibody, a protein produced by the body's immune system. The antibody interferes with the way FVII works in the body. If you have acquired FVII Deficiency you may have variable bleeding symptoms ranging from mild to severe.

What are the symptoms of
Factor VII Deficiency?

The symptoms of **FVII Deficiency** may often depend upon how much FVII you have circulating in your blood, or how well it functions. **If your FVII level is below 10% of the normal amount in the blood, you may have an increased risk of severe bleeding;** however, sometimes you may have no significant bleeding at all. You can still have severe bleeding even if your FVII levels are greater than 10%. **Normal FVII activity levels range from 50-200%.**[1] If the lab tests your FVII activity and the results are less than 10% then you have a severe deficiency. A severe deficiency is usually associated with severe bleeding symptoms including spontaneous (meaning occurring without injury or trauma) bleeding in the brain (intracranial hemorrhage or ICH), poor wound healing, and miscarriages. **Other symptoms of this bleeding disorder include easy bruising, gum and mouth bleeding, heavy menstrual bleeding, nose bleeds (epistaxis), prolonged bleeding after surgery, and joint and muscle bleeds**. Because of the current limitations of laboratory tests, it is often difficult to accurately measure FVII levels below 10%.[2] If you are a carrier and experience bleeding symptoms, it is important to seek medical care from a hematologist (a doctor specializing in the study of blood) or Hemophilia Treatment Center (HTC).

Classification of FVII Deficiency[3]

less than 10%

Higher risk of severe bleeding:

- Muscle hematomas
- Joint bleeds (hemarthrosis)
- Bleeding into your stomach or intestines (Gastrointestinal or GI bleeds)
- Heavy menstrual bleeding
- Bleeding during childbirth
- Central nervous system bleeding

10% - 20%

Low risk of severe bleeding:

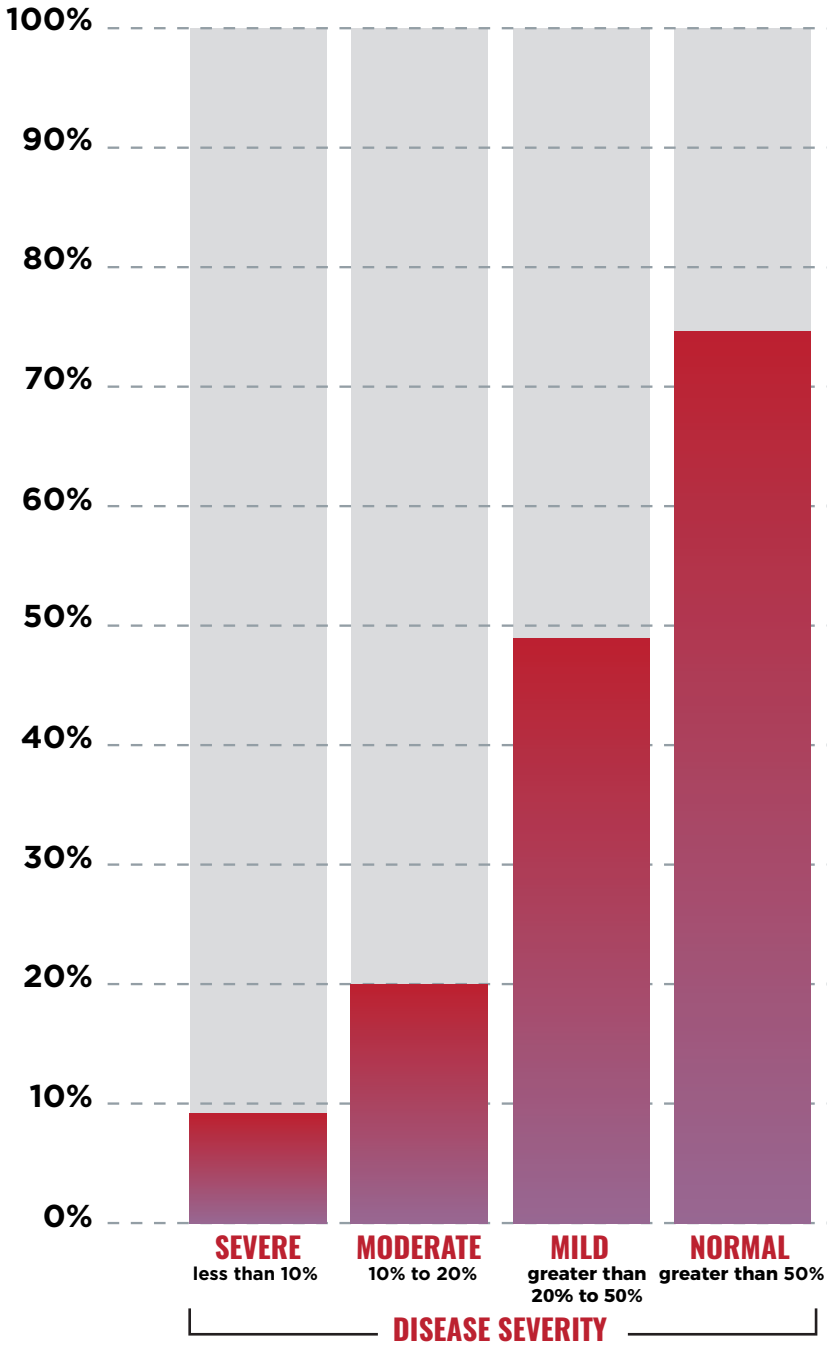
- Nose bleeds (epistaxis)
- Easy bruising
- Gum bleeding
- Heavy menstrual bleeding
- Bleeding during childbirth
- Lumps underneath bruises (hematomas)
- Blood in your urine (hematuria)

greater than 20% - 50%

Often don't show symptoms, but might have problems with bleeding during:

- Trauma,
- Surgical procedure
- Pregnancy/delivery

FVII Activity Level



How is Factor VII Deficiency diagnosed?

The severe form of FVII Deficiency is often diagnosed due to:

- excessive bleeding either from a heel stick to obtain blood or circumcision shortly after birth
- a bleed in the brain during the first six months of life (intracranial hemorrhage)
- a bleed in the stomach or intestines (gastrointestinal bleeding)

The milder forms of the disorder may be diagnosed later in childhood or even in adulthood.[3] When a bleeding disorder is suspected, routine screening tests are done where your doctor will draw some of your blood and send it to the lab to test. If the screening tests are abnormal, your doctor will order some additional tests to try to find out what kind of bleeding disorder you have. **The FVII assay is a sensitive test and is best done through a center specialized in the care of patients with bleeding disorders, called a Hemophilia Treatment Center (HTC).**[4] The HTC can also help you identify the type of genetic mutation causing this deficiency.

How is Factor VII Deficiency treated?

For optimal care, it is recommended that you find a specialized doctor, or hematologist, who is experienced in the treatment of FVII Deficiency. These doctors often work at HTCs.

Recombinant Factor VIIa is a manufactured replacement protein and is considered to be the best treatment for FVII Deficiency. It is used to prevent bleeding (prophylaxis) or to treat bleeding episodes when they happen. Recombinant Factor VIIa is a type of medication that is given in a vein (IV) to bring your FVII level back up to normal. It is produced in a laboratory and does not contain any human blood. Alternately, fresh frozen plasma can also be used to treat FVII Deficiency. It comes from human blood, contains FVII, among other things, and is used in an emergency when recombinant Factor VIIa is not available.[5]

Recombinant Factor VIIa doesn't last long after it is given, since it has a short half-life, so repeat dosing may be needed. In addition to replacing FVII, antifibrinolytics can be used alone or with FVII replacement to help control bleeding. Antifibrinolytics (such as tranexamic acid) are medications that are taken in pill or liquid form that help the clot you make last longer.[5]

"Recombinant Factor VIIa is a type of medication that is given in a vein (IV) to bring your FVII level back up to normal."

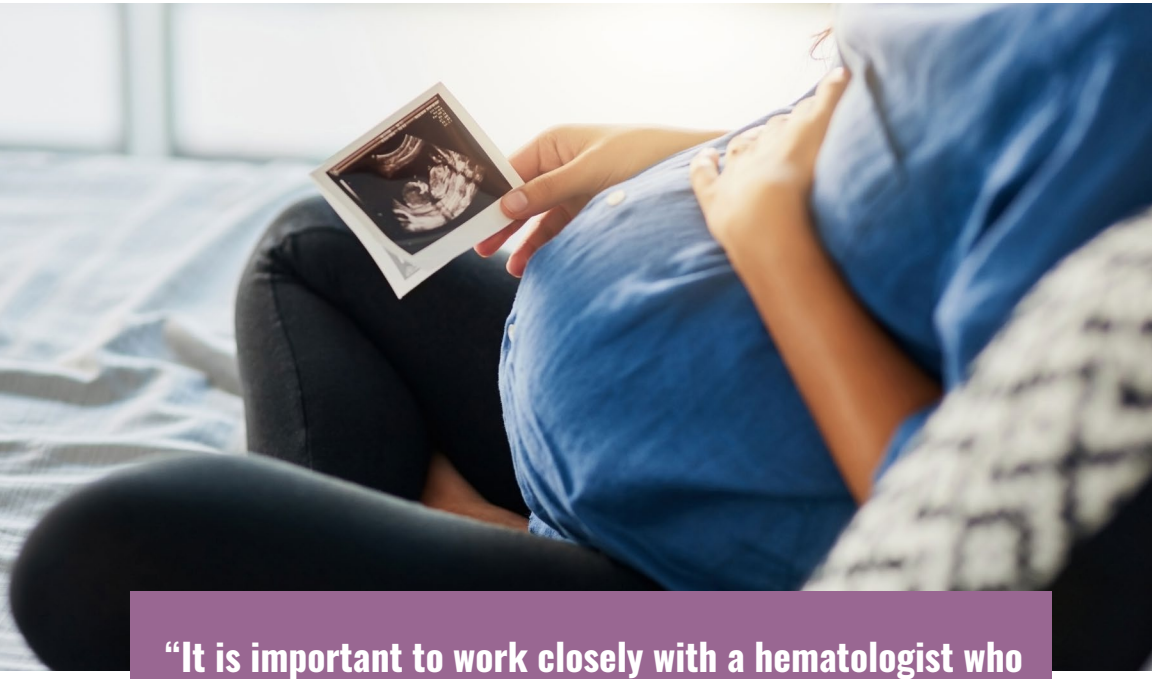
For the most current list of FDA approved treatments for all bleeding disorders, including FVII Deficiency, visit:

www.hemophilia.org/healthcare-professionals/guidelines-on-care/products-licensed-in-the-us.

Your healthcare provider will work with you to develop an ideal treatment plan based on your bleeding history and the type and severity of the bleeding you have.

What special precautions need to be taken when considering pregnancy?

Pregnancy itself does not require any special precautions. 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 FVII Deficiency. As we mentioned earlier, these specialized doctors are often found at a 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). HTC hematologists will also be able to provide care to your baby and provide testing as needed.[1]



"It is important to work closely with a hematologist who is experienced in the treatment of FVII Deficiency."

ADVICE FROM OTHER FVII COMMUNITY MEMBERS

> Don't let it stop you from following your dreams."
>
> **FVII Patient**

> You were chosen to be unique so that you can share your gift with the world."
>
> **FVII Patient**

> Early prophylaxis is a lifesaving tool."
>
> **FVII Patient**

> You have to be your own advocate. Speak up if you are not getting the treatment you need."
>
> **FVII Patient**

> Don't give up, continue to learn and network, become a Victor instead of a Victim!"
>
> **FVII Patient**

> You will get through this; you can live a great quality of life. Stick with it, keep knocking down walls, use community resources."
>
> **FVII Patient**

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, work, emergency rooms, and non-hematology specialists.
- Learn more about advocating for appropriate treatment in an emergency room (ER) or with other healthcare providers who may not know much about FVII Deficiency. Always carry your treatment plan letter provided by your HTC when travelling or going to the emergency room.
- Find out where to connect with others with bleeding disorders locally.

Resources:

The National Hemophilia Foundation

- **Factor 7 webpage:** https://www.hemophilia.org/bleeding-disorders-a-z/types/other-factor-deficiencies/factor-vii
- **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/

Rare Coagulation Disorders

- **Factor VII Deficiency:** http://www.rarecoagulationdisorders.org/diseases/factor-vii-deficiency/disease-overview

The National Institute of Health

- **Genetic and Rare Diseases Information Center:** https://rarediseases.info.nih.gov/diseases/2238/factor-vii-deficiency

Mayo Clinic

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

Comprehensive Health Education Services (CHES)

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

National Organization for Rare Disorders (NORD)

- **Rare Disease Database:** https://rarediseases.org/rare-diseases/factor-vii-deficiency/

References:

1. Rare Bleeding Disorder website. https://www.rarebleedingdisorders.com/bleeding-disorders/factor-7.html. Accessed December 17, 2020.
2. National Hemophilia Foundation Website. Factor VII (Labile factor or Proconvertin) Deficiency (Alexander's Disease). https://www.hemophilia.org/bleeding-disorders-a-z/types/other-factor-deficiencies/factor-vii. Accessed October 25, 2020.
3. Canadian Hemophilia Society. Factor VII Deficiency; An Inherited Bleeding Disorder. 2001. https://www.hemophilia.ca/wp-content/uploads/2018/04/Factor-VII-deficiency-2014.pdf. Accessed December 17, 2020.
4. Rare Coagulation Disorders Resource Room. http://www.rarecoagulationdisorders.org/diseases/factor-vii-deficiency/medications-treatment. Accessed November 15, 2020.
5. Sevenet, Pierre-Olivier et al. Factor VII deficiency: from basics to clinical laboratory diagnosis and patient management. Clinical and Applied Thrombosis/Hemostasis. 2017,703-710.

Acknowledgements:

The **National Hemophilia Foundation (NHF)** is dedicated to finding cures for inheritable blood disorders and to addressing and preventing the complications of these disorders through research, education, and advocacy enabling people and families to thrive. The NHF would like to express its appreciation to Sonia Nasr/Gloval LLC and Nikole Scappe for the content development, the rare working group members, Barbara Forss, Natalia Winberry, MNLM, Lena Volland, PT, DPT, and Kate Nammacher, MPH, for their insights and review. A special thank you to Suchitra S. Acharya, MD, Leonard Valentino, MD, and all the individuals who reviewed drafts of this publication. This publication was developed through the support of NHF's 2021 Community Education Program sponsors: BioMarin, Genentech, Hemophilia Alliance, Sangamo, Sanofi Genzyme, and Takeda.

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.

NATIONAL HEMOPHILIA FOUNDATION

for all bleeding disorders

Contact Us:

7 Penn Plaza, Suite 1204
New York, NY 10001

www.hemophilia.org

Phone : 212.328.3700
Toll Free : 888.463.6643
Email : info@hemophilia.org