

changing
possibilities in
hemophilia®

Your resource guide to help care for inhibitors





Living with an inhibitor

Hemophilia with **inhibitors** is different than regular hemophilia. Inhibitors sometimes bring uncertainty and some fear. Inhibitors always bring questions. That is why we created this guide.

Real people living with inhibitors helped make this guide. It is full of information and resources about inhibitors.

Words in **bold type** are defined in the Glossary.

The Novo Nordisk **Consumer Council** made this brochure possible.

You are not the only one caring for a person with inhibitors! The **Changing Possibilities Coalition** is a group of real people living with inhibitors. Join us at **ChangingPossibilities-US.com**.



Don't feel like you have to learn everything in this guide in one day. This booklet can be used when you need it.



Models are used for illustrative purposes only.



About 1 in 3 people with severe hemophilia A develops an inhibitor.

Hemophilia basics

You might know the basics already, but let's make sure. When a person bleeds, the body takes steps to stop the **bleeding**. Thirteen different proteins called **clotting factors** work together to form a **blood clot**. This is called the **blood clotting process**, or the **clotting cascade**. Hemophilia prevents this process from working.

People with hemophilia have a clotting factor that is missing or reduced. This means they have trouble forming blood clots. And that makes it harder to stop bleeding.

How do people get hemophilia?

Hemophilia is a **hereditary disorder**, which means most people with hemophilia are born with it. In most cases, it is passed from the mother's side of the family to the child. In some cases, a person develops it without any family history of hemophilia. According to the Centers for Disease Control and Prevention (CDC), hemophilia affects 1 in 5000 male births in the United States.

Myth about hemophilia

"Hemophilia makes you bleed faster."

Hemophilia does not mean you bleed faster. Hemophilia only affects how long it takes to form a clot. A person may bleed longer but not faster.

Types of hemophilia

There are 2 main types of hemophilia:

- **Hemophilia A** (also called Factor VIII [8] deficiency). This is the most common type, occurring in 80% of people with hemophilia. It is caused by a lack of the clotting factor called Factor VIII (8)
- **Hemophilia B** (also called Factor IX [9] deficiency). This is caused by a lack of Factor IX (9), occurring in 20% of people with hemophilia

There are different levels of severity in hemophilia. Hemophilia can be mild, moderate, or severe.

How do I treat hemophilia?

Hemophilia is treated with **factor replacement therapy**. The missing Factor VIII or IX is injected, or **infused**. This helps form a blood clot to help stop the bleeding.

Inspirational inhibitor experiences

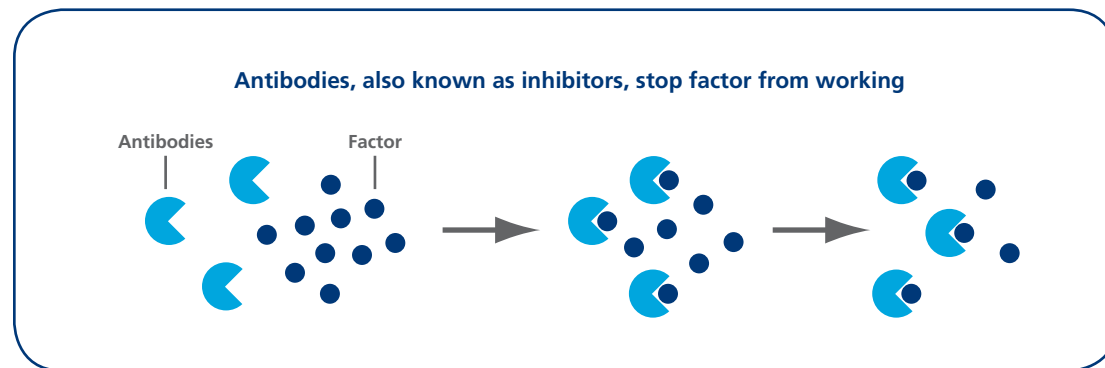
"It's important to balance setting rules and being overprotective. Kids with inhibitors can play sports and have a happy and active life as long as they take certain precautions."

—Corby Lust, mother of a 5-year-old boy with an inhibitor

Why won't factor work anymore?

Sometimes factor stops working. This is because the body makes **antibodies** to the factor. Antibodies stop, or inhibit, the factor from working.

Your immune system helps defend your body by fighting bacteria and viruses. When some people get factor replacement therapy, their immune systems attack it. The body produces antibodies called "inhibitors" that stop the factor from working.



Who develops inhibitors?

Your chance of getting an inhibitor depends on a few things:

- Type of hemophilia
- Level of hemophilia
- Family history
- Race
- High-dose factor replacement therapy in a short period of time

People with severe hemophilia are more likely to get inhibitors than those with mild hemophilia. Hemophilia with inhibitors is also more common in people with hemophilia A.

Having a family history of inhibitors means you are more likely to get them. People of African American or Hispanic descent are also at a greater risk.

When do inhibitors develop?

Inhibitors can develop only after replacement factor has been used. They do not exist at birth. Most inhibitors develop in the first 9 to 50 injections. Inhibitors may appear after years of treatment, but these cases are rare.



What tests measure inhibitors?

A blood test called the **Bethesda inhibitor assay** is used to detect inhibitors. The test uses **Bethesda units (BUs)** to measure the strength of inhibitors. Stronger inhibitors result in higher **titers** (high BUs).

In most cases, a stronger inhibitor means it is harder to treat.

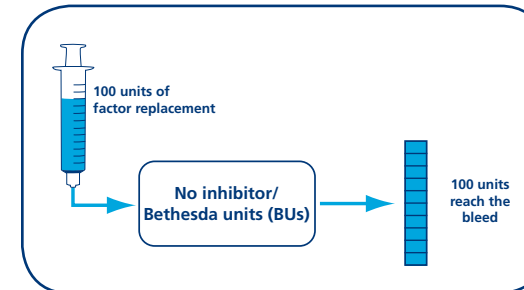


Inspirational inhibitor experiences

"Inhibitors can make you feel alone, but you're not. I find sharing stories with others dealing with inhibitors to be a big help."

—Cary Shaw, a 52-year-old man with an inhibitor

Measuring inhibitors

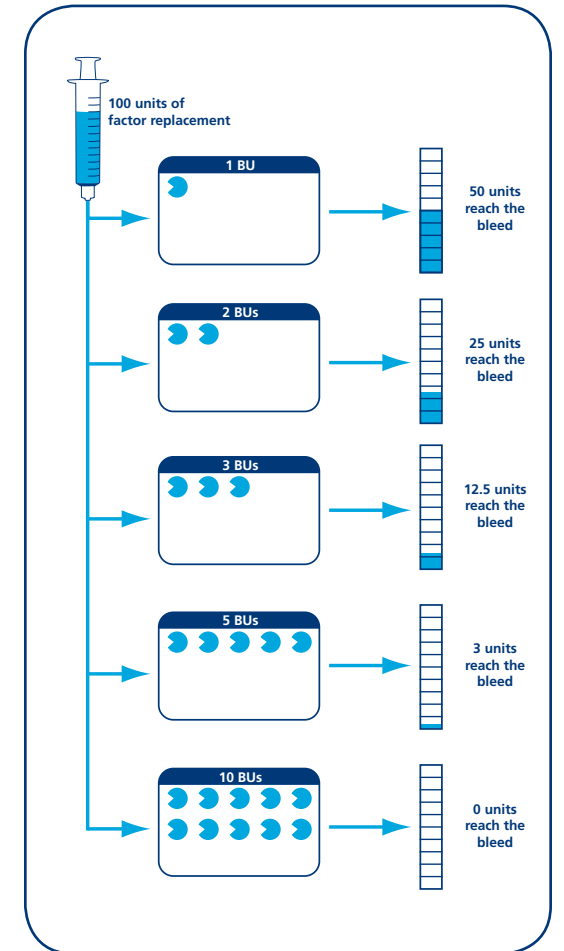


BUs show how strong your inhibitor is. This is called your titer. The higher your titer, the less likely it is that normal factor will work.

When there is no inhibitor (0 BU), all the factor you infuse reaches the bleed.

As your titer rises, less factor reaches the bleed. The inhibitor "inhibits" the factor from working. The higher the titer, the more factor you need to stop a bleed.

Once your titer reaches 5 BUs, almost none of your factor reaches the bleed. This means that normal factor probably will not work. People with high titers need **bypassing agents** instead of replacement factor.



Interact with this chart at

ChangingPossibilities-US.com/LifeWithInhibitors/MeasuringInhibitors.aspx.

Be prepared

The best plan for treating bleeds: be prepared. Work with your hemophilia treatment center (HTC) to make a plan before bleeding occurs. That way you know exactly what to do when a severe bleed happens. To help you in this process, use the guides in the Resources section of **ChangingPossibilities-US.com**. They will help you give information to doctors, nurses, babysitters, schools, and day care centers. So no matter what the situation, you can take comfort that you are prepared.

How do I recognize a bleed?

Before you can treat a bleed, you must be able to recognize a bleed is happening. Bleeding can occur inside or outside the body. This may make it hard to know that something is wrong. Children may be too young to say how they feel. Look out for signs of a bleed, listed in the table below.

Recognizing bleeding episodes: signs and symptoms				
Joint	Muscle	Head	Spinal Cord	Stomach
<ul style="list-style-type: none">• A tingling feeling in the joint• Not wanting to move the joint• Limited mobility• Swelling• Pain (usually gets worse the longer the bleed is not treated)• Warmer skin over the joint	<ul style="list-style-type: none">• Pain or vague aching in the muscle• Limping• Unwillingness to use the affected arm or leg• Inability to put a heel on the floor when walking or standing• Limited mobility in the arm or leg• Swelling• Warmth at the bleeding site• Severe or shooting pain (this means there is pressure on the nerves)• Numbness or tingling	<ul style="list-style-type: none">• Headache that won't go away• No energy• Difficulty waking• Trouble seeing; blurry vision• Difficulty walking straight• Bleeding from the ears or nose• Throwing up, dizziness, and/or sudden or violent movements	<ul style="list-style-type: none">• Weakness, tingling, or pain in the arms or legs• Trouble with urination or bowel movements	<ul style="list-style-type: none">• Throwing up blood or black, syruplike material (may look like coffee grounds)• Red or black bowel movements (may look like tar)

IMPORTANT! Head, spinal cord, and stomach bleeds require immediate medical attention.



Inspirational inhibitor experiences

“Bleeds are stressful and if you’re not ready, you panic. What happened was that by waiting, I would let the bleed get worse. With a plan in place, you don’t panic—you just act.”

—Debbie Porter, mother of a 16-year-old boy with inhibitors



How are bleeds stopped when there is an inhibitor?

Inhibitors make it hard to stop a bleed. They stop replacement factor from working. People with **high-responding** inhibitors have to use bypassing agents instead of replacement factor. Bypassing agents allow clotting to take place without Factor VIII or IX. They work to bypass the steps where Factor VIII or IX is needed. This allows blood to clot.

What types of bypassing agents are available?

Each person with hemophilia with inhibitors is unique. That means his treatment plan should be, too. Your HTC will make your treatment plan fit your needs. There are different types of bypassing agents. These include plasma derived (made from human blood) and recombinant (not made from human blood). Your HTC will work with you to decide the best choice to stop bleeding fast.

R.I.C.E. therapy should be used to help control bleeds. To ease pain and swelling, do the following before, during, and after treatment:

Rest the bleeding area for at least 24 hours.

Ice the area to relieve pain for a while.

Compress it by wrapping the area for the first 24 hours. Check every 2 hours to make sure the wrap is not too tight.

Elevate or raise the area above the heart.

What can I do to ensure the best treatment?

Treat quickly. The faster you treat, the faster you stop the pain and bleeding. Bleeds happen in or near joints such as the ankles, knees, hips, elbows, and shoulders. Bleeds that are not treated quickly can lead to bleeds that are difficult to control. The more blood there is in the joint, the more damage it can cause. It is important to treat as early and as rapidly as possible.

Long-term effects of knee bleeds



Watch a video about the complications of joint bleeds at ChangingPossibilities-US.com/LifeWithInhibitors/KeepingJointsHealthy.aspx.

Inspirational inhibitor experiences

"I treat as fast as I can. I don't want to let it get worse while I figure out if I should treat."

—Ashley Druckenmiller, mother of 3- and 4-year-old boys with inhibitors



Inspirational inhibitor experiences

"I tell new patients, 'Take a look at me. As a child, I faced many obstacles, but now I'm an adult who overcame them.' With the proper support, kids can be resilient."

—Eric Lowe, a 29-year-old man with an inhibitor

Can I get rid of the inhibitor?

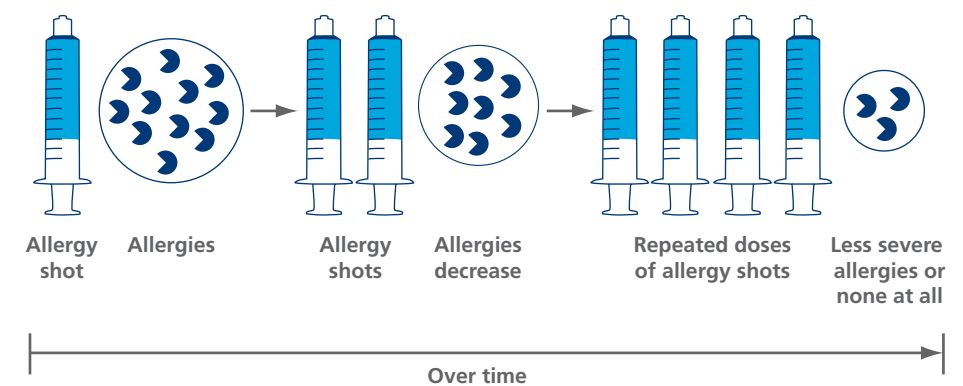
Immune tolerance induction (ITI) therapy is the only way to get rid of inhibitors. It does not work for everyone. With ITI, repeated doses of factor are infused over a long period of time.

The goal of ITI is to make the immune system stop making inhibitors. ITI is a complex treatment and it takes a lot of work.

You will partner with your HTC to make a plan. It is important to keep treating bleeds regularly even if you are using ITI.

ITI is like getting allergy shots

An allergy is the immune system's response to something unknown. Allergies set off the same response from the immune system as inhibitors. Sometimes people can get rid of their allergies by getting allergy shots. Both ITI and allergy shots give repeated doses of the "allergic" substance over time. This makes the immune system get used to it. If allergy shots work, the patient will have allergies that are less severe or none at all.



Travel smarter, not harder

Like many things, inhibitors can make traveling a challenge. Coalition members have provided these tips to help simplify your travel:

- Take a copy of all prescriptions and labels that identify the medicines
- Know the names and locations of the nearest HTC's around your destination
- Check your health insurance for travel restrictions
- Bring medical ID in case of an emergency
- Keep your medicine with you so it is not hard to get to
- Give yourself plenty of time, especially if you use mobility devices such as strollers, wheelchairs, or crutches



Did you know? There is a helpful travel guide in the Resources section of **ChangingPossibilities-US.com**. Check it out!

Get help with the costs

SevenSECURE® is a support program that helps handle the costs that come with inhibitors. It was created out of a commitment to reduce the burden that inhibitors can place on people's lives. Visit the Support Programs section of **ChangingPossibilities-US.com** to find out how you can enroll in SevenSECURE®.

SevenSECURE® offers the following services for people with inhibitors:

- Health insurance support
- Lifetime insurance cap tracking
- Help in finding new or additional insurance
- Premium assistance grants
- Tutoring and lessons grants
- College and vocational scholarships
- Adult education grants for caregivers
- Financial assistance for dental visits
- Assistance with miscellaneous medical costs
- Grants to cover costs of mobility devices
- Grants to attend educational meetings and conferences



You are not alone

A good bond with your HTC is vital. They are always around for you and your family when you need help living with inhibitors. Your HTC can offer great information, advice, and services.

You can locate the nearest HTC by contacting the National Hemophilia Foundation (NHF) at 1-212-328-3700 or **hemophilia.org**, or by visiting the CDC Web site at https://www2a.cdc.gov/ncbddd/htcweb/Dir_Report/Dir_Search.asp.



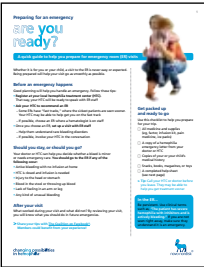
Inspirational inhibitor experiences

*"I'm using SevenSECURE® to help my family in many different ways."
—Ashley Druckenmiller, mother of 3- and 4-year-old boys with inhibitors*

Emergencies—are you ready?

Preparing for an emergency can help you be successful in case one occurs. Try these tips from Coalition members:

- Register your child at your local HTC
- Visit the ER *before* an emergency. Get to know the staff and have a talk about inhibitors
- Have a bag packed and ready to go
- Be sure you know the difference between a minor bleed and an emergency



Did you know? In the Resources section of **ChangingPossibilities-US.com**, there's a quick guide to help you plan for ER visits. Download it today!



Inspirational inhibitor experiences

"The whole family first went to an Inhibitor Summit in Philadelphia and it was fabulous. The summits have taught us so much."
—Jen Guerrero, mother of a 9-year-old boy with an inhibitor

Other resources

National Hemophilia Foundation (NHF)
hemophilia.org

Changing Possibilities in Hemophilia on Facebook®
facebook.com

HemAware
hemaware.org



People with inhibitors and their caregivers could benefit from your experience. To share your story, visit ChangingPossibilities-US.com/ChangingPossibilities/MyStory2.aspx.

Reach out for support

When you are dealing with an inhibitor, you can feel like you are on your own. That is why The Changing Possibilities Coalition was developed. The Coalition was formed so patients and families could connect. It is a place to share information, resources, experiences, and advice. It is an educated, close-knit community empowered to change possibilities.

ChangingPossibilities-US.com is your place to find out more about living with inhibitors. The Web site has real stories of people living with inhibitors. Plus it has a wealth of information and resources created by real people dealing with inhibitors. Go to **ChangingPossibilities-US.com** to join The Coalition today!

Inspirational inhibitor experiences

"It's just great to know that there is a community of people who are going through the exact same thing as you."
—Jen Guerrero, mother of a 9-year-old boy with an inhibitor



A

Antibodies—Proteins made by blood cells. They attack substances that the body thinks present a danger. Antibodies that attack replacement therapies for hemophilia are *inhibitors*.

B

Bethesda inhibitor assay—A test performed in the lab and used to measure the strength or titer of an inhibitor.

Bethesda units (BUs)—Units used to measure inhibitor levels, also called *titers*.

Bleed or **bleeding**—A collection of blood in an area. It is a term used by people with bleeding disorders to describe their bleeding episodes.

Blood clot—The plug your body forms at the place where you have been injured to stop the bleeding.

Blood clotting process—The process in the body by which the blood forms clots to stop bleeding.

Bypassing agents—Agents or products designed to stimulate the blood clotting process by bypassing the deficient factor with a clotting factor that occurs later in the chain reaction.

C

Changing Possibilities Coalition—A community of patients and caregivers who share information, resources, experiences, and advice and are empowered to change possibilities in the inhibitor community.

Clotting cascade—The series of events that make up the blood clotting process.

Clotting factors—Proteins in the blood that are needed for normal blood clotting.

Consumer Council—A group of patients and parents who work with Novo Nordisk to create materials that empower the inhibitor community.

F

Factor replacement therapy—In hemophilia, the infusion of clotting factor(s) to serve as a temporary substitute for the body's missing or low levels of factor. In hemophilia A, Factor VIII is infused as the replacement therapy.

H

Hemophilia—A clotting disorder that occurs mostly in males. The disorder makes bleeding hard to control.

Hemophilia A—A bleeding disorder caused by a lack of Factor VIII. It is sometimes called *classic* or *standard hemophilia*.

Hemophilia B—A bleeding disorder caused by a lack of Factor IX. It is sometimes called *Christmas disease*.

Hereditary disorder—A disorder that is passed from parents to children.

High responder—A person whose inhibitor level rises very high after receiving factor replacement therapy.

I

Immune tolerance induction (ITI) therapy—Therapy that tries to get rid of inhibitors. It involves regular (maybe daily) infusions of high amounts of a specific factor. If successful, it reduces the immune system's response to the factor. That means the body does not create antibodies to the factor.

Infuse—To inject fluid into the bloodstream through a vein by using a needle and syringe.

Inhibitors—Antibodies in the blood that react to infused factor and hinder clotting.

L

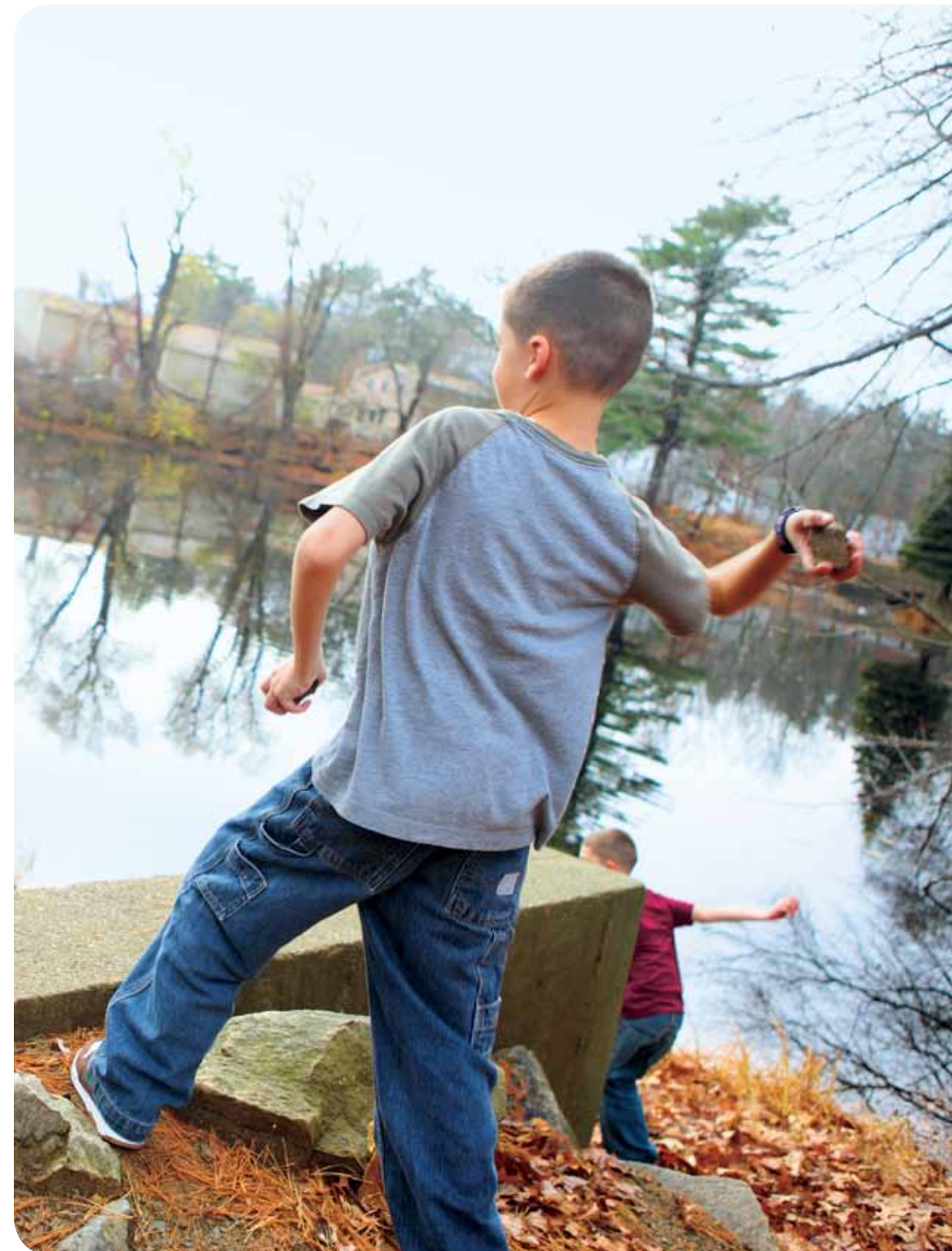
Low responder—A person whose inhibitor level rises only slightly after receiving factor replacement therapy.

P

Port—A device that is put under the chest wall and allows for factor infusions without the person having to locate a vein.

T

Titer—Concentration or strength of a substance such as an inhibitor.



Your experience can enrich others

As a caregiver, you have a story to tell. Your unique experiences can be valuable lessons to other caregivers. Sharing what you know can help people who are just like you improve care for people with inhibitors. Visit **ChangingPossibilities-US.com** today to read the stories of caregivers who are just like you and share your story.

Join The Coalition and get involved in the inhibitor community. It could make a difference in your life or someone else's life in the community. Get started by visiting **ChangingPossibilities-US.com**.



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