Have a Bleeding Disorder? Get Tested Regularly for an Inhibitor

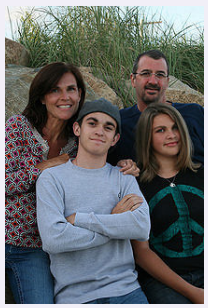
Inhibitors – a potentially dangerous health problem – affect people with bleeding disorders such as hemophilia and von Willebrand disease (VWD). If you have a bleeding disorder, finding an inhibitor early and receiving treatment can lower your chance for developing serious health problems. The sooner it is discovered, the quicker you can get treatment.

Blood contains many proteins called clotting factors that help to stop bleeding. People with hemophilia are missing, or have lower levels of, either clotting factor VIII (factor 8), called hemophilia A, or factor IX (factor 9), called hemophilia B. People with the most severe form of von Willebrand disease (VWD), which is called VWD type 3, are missing von Willebrand factor and have lower levels of factor VIII. People with these conditions may experience bleeding episodes in their joints, muscles, and internal organs. A bleeding episode is a bleed that lasts longer than several minutes. The bleed can occur in response to little or no physical trauma. Medicines called clotting factor concentrates (or simply "factor") are rich in these missing proteins, and are infused or injected into a vein to replace the missing proteins in the blood. Doctors commonly prescribe infused clotting factor concentrates to treat bleeding disorders because they help to improve the blood's ability to clot in order to stop bleeding episodes and help prevent future ones.

What are inhibitors?

Some people with hemophilia or VWD type 3 may develop an inhibitor. When a person develops an inhibitor, their body responds to the clotting factor treatment in the same way it would against a foreign substance; their body stops accepting the clotting factor treatment as a normal part of their blood and tries to destroy it with an inhibitor. The inhibitor stops the clotting factor treatment from working, making it more difficult to stop or prevent bleeding episodes.

People with hemophilia or VWD type 3 who develop an inhibitor are **twice as likely to be hospitalized** for a bleeding episode because the clotting factor treatment does not work as well to stop the bleeding.



"The complications of long-term damage to his joints, the unrelenting pain, just general quality of life, that's been, by far, the biggest challenge. Another big challenge for us as a family, and for my husband in particular, is the high cost of hemophilia, in general, and treating an inhibitor, in particular."

— Jane S. about her son

Who develops an inhibitor?

If you have hemophilia A or B or VWD type 3, you may be at risk for developing an inhibitor. This is true regardless of your age or the severity of your condition. It is estimated that **1 out of every 5 people with hemophilia A** and **3 out of every 100 people with hemophilia B** will develop an inhibitor in their lifetime. For some people, the inhibitor is transient, which means that it may last only a short time and may not require treatment. For other people, however, the inhibitor can have serious health consequences and require special medical treatment.

It is not yet known exactly what causes an inhibitor to develop. Certain characteristics may increase your chance for developing an inhibitor, including:

- The type of bleeding disorder you have. People with **hemophilia A, hemophilia B, or VWD type 3** are at risk for developing an inhibitor. People with VWD types 1 and 2 are not prone to inhibitors.
- The specific changes in your genes that caused your bleeding disorder (called the **genotype)**. There are many different changes in the genes that can cause a bleeding disorder. People with certain gene changes are more likely to develop an inhibitor than people with other gene changes.

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- Number of days the person has infused with clotting factor concentrates over their lifetime. Inhibitors are most likely to develop during the first 50 times (measured by days of infusion) that a person infused with clotting factor concentrate treatment. However, they can develop at any time.
- Frequency and amount of clotting factor concentrate treatment. Unusually large amounts of factor concentrate over a short period of time (i.e., during or after surgery) may increase the likelihood that an inhibitor will develop.
- Race and ethnicity. Inhibitors may be more common among racial and ethnic minorities.
- Family history of inhibitors. People with a family history of inhibitors may be more likely to develop an inhibitor themselves.

Will I know if I have an Inhibitor?

A person who develops an inhibitor may not show any obvious physical signs or symptoms. They might not have increased bleeding or require more clotting factor concentrate to treat a bleed. Therefore, a laboratory test is necessary to diagnose an inhibitor.

Should I be tested every year for an inhibitor?

The best way to find an inhibitor early is through routine testing. It is important that all people with hemophilia or VWD type 3 who use clotting factor concentrates get tested for inhibitors at least once a year. The Nijmegen-Bethesda assay is the standard laboratory test to diagnose an inhibitor. For patients treating with Hemlibra® (emicizumab), a specialized test called the chromogenic Bethesda assay is needed to diagnose an inhibitor. For more information on when to get tested, see the recommendations put forth by the National Bleeding Disorders Foundation (NBDF) Medical and Scientific Advisory Council (MASAC), described here http://bit.ly/1RRubUm.

It is important to find an inhibitor early. Studies have found that the sooner an inhibitor is detected, the more likely a person is to respond to treatment designed to eliminate the inhibitor. In some cases, inhibitor treatment can last several years.

What can I do to help identify a potential problem early?

- **Enroll in Community Counts** (https://www.cdc.gov/communitycounts/) at your local hemophilia treatment center (HTC) and take advantage of the free inhibitor testing provided as part of this program. Community Counts aims to gather and share information about common health issues, health-and treatment-related problems, and causes of death affecting people with bleeding disorders who receive their care at HTCs. Participation in Community Counts also helps the Centers for Disease Control and Prevention (CDC) gather information about inhibitors in the bleeding disorders community. This information is used to better understand why inhibitors develop and the best ways to prevent them. Community Counts is a collaborative effort between CDC, the American Thrombosis and Hemostasis Network (ATHN), and the U.S. HTC network.
- **Keep records of your infusions** so that your doctor can tell if the prescribed clotting factor concentrate treatment is working well for you.
- **Be alert for changes in how your bleeding episodes respond to clotting factor concentrate treatment**, and notify your doctor right away if you notice changes.
- **Get a laboratory test** to determine your genotype (the changes in your genes which cause you to have a bleeding disorder), and **ask your doctor about your chance of developing an inhibitor**. People with certain genotypes have a higher chance of developing an inhibitor.
- **Participate in research studies and/or clinical trials** to help researchers learn what increases the likelihood for inhibitor development. Once it is known who is more likely to develop an inhibitor, it may be possible to create strategies to prevent the inhibitor from occurring. Information from many people are needed in order to identify what causes inhibitors.

For more information on inhibitors, please visit the CDC website http://www.cdc.gov/ncbddd/hemophilia/inhibitors.html.

Get free inhibitor testing today! Community Counts is a CDC-funded public health monitoring program that provides inhibitor testing to more than 135 HTCs across the country.

For more information, visit the Community Counts website https://www.cdc.gov/communitycounts/