Focused Care for
Bleeding Disorders

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Living with von Willebrand disease

This booklet has been prepared to help you understand von Willebrand disease. It contains general educational material and is not intended to constitute medical advice or the rendering of medical care. Accredo is not licensed to practice medicine. The diagnosis and treatment of bleeding disorders should only be done by, or under the direction of, a qualified doctor. The patient's doctor should always be consulted with regard to the patient's medical treatment.

Leslie, RN
Bleeding Disorders Educator

You've been diagnosed with a bleeding disorder. You may be scared, confused or uncertain about where to go for the information you need. We understand ... and we're here to help. At Accredo, a specialty pharmacy, our team of specialty-trained pharmacists, nurses and care advocates are solely focused on treating bleeding disorders and understand how to help you manage your diagnosis. That's why we've provided this comprehensive guide to living with von Willebrand disease – it's just one more way we're here to support you and help you live your best life.

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What is von Willebrand disease?

Von Willebrand disease (VWD) is an inherited bleeding disorder characterized by heavy bruising and bleeding from mucous membranes, including the mouth, nose, throat and gastrointestinal tract and heavy menstrual periods in women and girls. It's named for Dr. Erik Adolph von Willebrand (pronounced von WILL-uh-brawn) of Finland who first identified it.

As the most common inherited bleeding disorder, VWD affects about 1% of the population. Although it is common, most people who have it have never been diagnosed. It differs from hemophilia A and B because it affects both males and females equally.

Common symptoms

- Easy bruising
- Frequent or prolonged nosebleeds
- Heavy or prolonged menstrual periods (that last more than 7 days)
- Prolonged bleeding after injury, surgery, dental procedures or childbirth
- Gastrointestinal bleeding

How von Willebrand disease affects the body

Normally, when a blood vessel is injured, the wall of the vessel narrows or constricts to reduce blood flow. After that, platelets – small disc-shaped cells in blood – stick to the injured site and to each other, forming a platelet plug. Then a series of blood proteins, referred to as clotting factors, weave together to form a clot. This clot is made of fibrin. After the fibrin clot forms, bleeding usually stops, and the body can repair the injured blood vessel.

People with von Willebrand disease have a low amount of or defect in the blood clotting protein called von Willebrand factor (VWF).

This glue-like substance (protein) does two different things in the body. VWF helps platelets in the blood stick to the injured blood vessel and then to each other to form the platelet plug. It also helps protect clotting factor VIII (another protein that is needed for blood to clot) as it moves around the body in the blood. People with VWD form a weak platelet plug that doesn't last very long. Bleeding then continues for a longer period of time or restarts after it has stopped.

Types of von Willebrand disease

Blood testing is needed because there are different treatments for each type and subtype of von Willebrand disease (VWD). It's important to know your exact type to make sure you receive the correct treatment.[1]

TYPE 1 is the most common and occurs in about three out of four people with VWD. People with this type have low levels of von Willebrand factor (VWF). Bleeding symptoms are usually mild.

TYPE 2 is due to VWF that does not work correctly and is divided into four different groups called subtypes. The four subtypes are 2A, 2B, 2M and 2N. People in each of these groups have normal amounts of VWF but it doesn't work the way it should.

Most people with type 2 VWD usually have mild to moderate symptoms, but some people can have more severe bleeding, especially in cases of injury.

Mild to moderate symptoms include prolonged bleeding from minor cuts; bleeding from nose and gums; heavy, prolonged periods; and easy bruising from minor bumps. Severe bleeding can be life threatening and can occur after injury or surgery.

TYPE 3 is a very rare type of VWD. It occurs when the body makes very little or no VWF. The body also has very low levels of factor VIII because there is no von Willebrand factor to protect it.

People with type 3 VWD often have severe bleeding symptoms. In addition to the types of bleeds usually seen in people with VWD, people with type 3 can have frequent bleeding in the joints and muscles, similar to people with hemophilia. Bleeds into joints are called hemarthrosis and can cause progressive damage to the joint (called arthropathy) when they occur often.

How did I get von Willebrand disease?

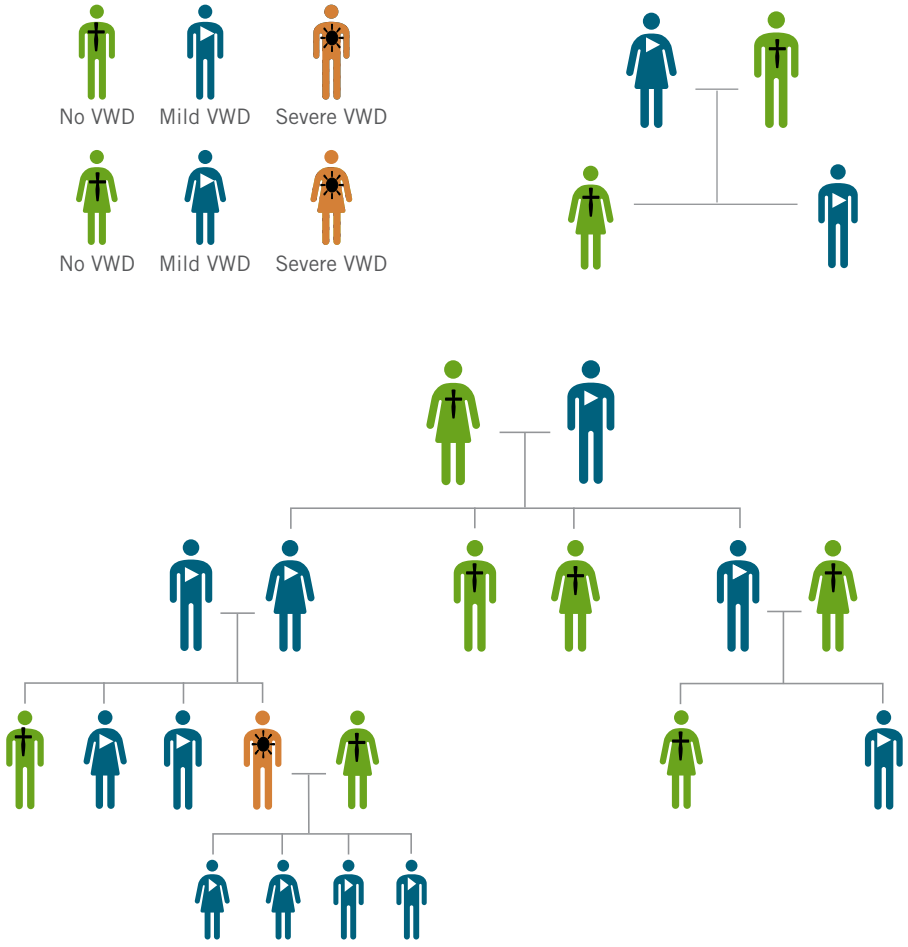
Von Willebrand disease is an inherited disorder that's usually passed down from one generation to the next.

People inherit type 1 and most type 2 VWD if only one parent passes on the gene to them. This is known as an autosomal dominant inheritance pattern. There is a 50% chance that each child will inherit the disease if either one of the parents has VWD.

It's common for people to report that others in their family have problems with frequent nose or stomach bleeds or all the girls have very heavy periods when no one has been diagnosed with von Willebrand disease.

Type 3 VWD and Type 2N are inherited when both parents transmit the gene. This is called an autosomal recessive inheritance pattern.

Symptoms can vary from one generation to the next. Some people have the genes for the disorder but don't have any symptoms; however, they still can pass it on to their children.



How is von Willebrand disease diagnosed?

Because von Willebrand disease is an inherited disorder, there's usually a history of other family members having problems with bleeding. It's common to find grandparents, aunts, uncles and cousins who report bleeding problems. Once VWD is suspected, a series of blood tests is used to confirm it. These tests check how long it takes for the blood to clot, the level of factor in the blood and how well it works.

Diagnosis sometimes requires that tests be repeated because every individual's von Willebrand factor and factor VIII levels can vary over time. Some things that cause von Willebrand factor levels to vary are:

- Stress, exercise, smoking and use of alcohol
- Hormone fluctuations in women and girls that are due to monthly menstrual cycle or pregnancy
- Medications such as aspirin, ibuprofen and similar drugs, as well as birth control pills
- Blood type – there are different baseline amounts of VWF in each of the four types (A, B, AB or O); for example, people with blood type AB tend to have higher von Willebrand factor levels, than people with blood type O

Diagnostic tests

VON WILLEBRAND FACTOR ANTIGEN (VWF:AG):
Tells how much von Willebrand factor is in the blood

RISTOCETIN (RIS-TO-SEE-TIN) COFACTOR ACTIVITY (VWF: RCOF):
Shows how well the von Willebrand factor in the blood works

FACTOR VIII CLOTTING ACTIVITY:
Tells how much factor VIII is in the blood

VON WILLEBRAND FACTOR MULTIMERS:
Shows the structure of the von Willebrand factor and helps the doctor determine the specific type of von Willebrand disease

PLATELET FUNCTION TEST:
Shows how well platelets and von Willebrand factor work together

How is von Willebrand disease treated?[2]

Once your type of von Willebrand disease is diagnosed, your doctor will develop a treatment plan based on the frequency and severity of symptoms. It is important to follow your treatment plan and see your doctor regularly. Contact your doctor if you have any questions or concerns.

Treatment may not be required in people with mild symptoms. Treatment may only be needed to prevent or treat bleeding associated with surgery, dental procedure, tooth extraction or an accident.[1]

Recommended treatments for von Willebrand disease

- Desmopressin products (DDAVP® or Stimate®)
- Antifibrinolytic agents
- Factor products
  - Factor products that contain von Willebrand factor (VWF) and factor VIII made from human plasma
  - Recombinant VWF products

What are desmopressin products?

Desmopressin is a synthetic (or manufactured) version of a natural hormone. When given, it causes the release of factor VIII and VWF stored in the lining of the blood vessels.

There are two forms of desmopressin to treat VWD:

1. Stimate, a desmopressin nasal spray, is the most commonly prescribed form. The brand-name product should always be used. The dose prescribed will depend on how much you weigh and will be either a single spray into one nostril or a spray into both nostrils. Stimate will help control most bleeds, but if it doesn't work, call your treatment center and follow their instructions.

   Before prescribing Stimate, your doctor will measure your response to a test dose that is given when you're not having a bleed. After the dose, the doctor will measure your response at different times to make sure the medicine works for you. If the test is being done before surgery, there should be several days between the test and the scheduled surgery.[3]

2. DDAVP, an injectable desmopressin, can be given into a vein, and is available for use during surgery or other select situations.

Both methods of desmopressin administration are considered safe but can still cause side effects including fluid retention and low sodium levels in the blood.
To minimize risk, follow these precautions when using this drug at home:

- Heed your doctor's recommendations to limit intake of water and other fluids.
- Use the medicine only once in every 24 hours.
- Use it for no more than three days in a row, unless your doctor specifically tells you.
- Do not give to children under the age of two years.
- People who are elderly or have a history of heart disease, high blood pressure or stroke should be very cautious and follow their doctor's instructions exactly.
- If desmopressin is prescribed before surgery, make sure that you tell the anesthesiologist so the amount of fluid you receive can be adjusted.
- Use very cautiously if you're pregnant or have just given birth. If you have a supply of it at home and become pregnant, be sure to discuss it with your doctors (hematologist and/or obstetrician-gynecologist) BEFORE you use it to control a bleeding episode.

DESMOPRESSIN IS NOT RECOMMENDED FOR PEOPLE WHO DO NOT RESPOND TO A DESMOPRESSIN TEST DOSE.

What are plasma-derived von Willebrand factor (VWF)-containing factor VIII products?

VWD can be treated with factor products that contain both factor VIII and VWF. Intravenous (IV) infusions of these products can effectively treat VWD and are recommended for people with certain types of VWD, such as Type 2B and Type 3, and people who shouldn't use desmopressin. Factor may also be used to treat severe bleeds for all people with VWD.[4]

Humate-P®, Alphanate® and Wilate® are the plasma-derived products that are FDA-approved for the treatment of VWD. All three products are made from human plasma collected from people who are rigorously tested to make sure viruses such as HIV, and hepatitis A, B and C are not present. The final products are also purified to inactivate and remove any viruses that are potentially present in human plasma.

What are recombinant von Willebrand factor products?

Vonvendi® is the first recombinant VWF concentrate approved by the U.S. Food and Drug Administration (FDA). It's produced without using any proteins collected from humans or animals. In contrast to the plasma-derived products, Vonvendi contains only VWF. It does not contain any factor VIII; therefore, a dose of factor VIII may be prescribed by your doctor to be administered with the first dose of Vonvendi given to treat a bleed.[5]

How is the correct dose of von Willebrand factor determined?

Von Willebrand Factor doses are calculated using something called ristocetin cofactor activity (RCof). A unit of RCof is a measure of the activity of VWF in the factor concentrate product and how well it works. Humate-P, Alphanate, Wilate and Vonvendi list the RCof units contained on the vial. Your doctor will determine your dosage based on your type of VWD and what type of bleed or surgery you are having. (Refer to "Diagnostic tests" section on page 5.)

How is your dose of von Willebrand factor administered?

Factor products are infused into a vein. The IV infusion can be done by a nurse, caregiver, or if you have been taught how, self-infused. You can receive treatment at home with any of these scenarios.

What are antifibrinolytic agents?

Antifibrinolytics are medicines that help hold a clot in place after it forms. These drugs help stop bleeding following minor surgery, tooth extraction or injury.

There are two of these products available: aminocaproic acid (Amicar®) and tranexamic acid (Lysteda® or Cyklokapron®).

They may be used alone or together with desmopressin or factor replacement therapy.[1]

Cryoprecipitate not recommended

A fraction of blood rich in factor VIII called cryoprecipitate was the primary treatment used for VWD in the past. However, since purified products that contain von Willebrand factor are available, it is no longer recommended unless one of those products is not available and it is an emergency with a life-threatening bleed.

General recommendations for living with von Willebrand disease

Sports and activities

Your choice of physical activity depends on the frequency and severity of your bleeding problems. Some safe exercises or activities are swimming, biking and walking. Football, hockey, wrestling and heavy weight lifting are more dangerous for people with bleeding disorders like VWD. Always check with your doctor before starting any exercise program.[1]

Medical identification

Everyone with VWD should wear medical jewelry to help others, including emergency staff, identify potential problems. You should also carry your doctor's name and contact information, so prompt and appropriate treatment can be given quickly.

Hepatitis vaccines

The American Academy of Pediatrics recommends hepatitis A and B vaccines for all children. In people with bleeding disorders, this immunization is particularly important, and primary immune response should be documented. Please discuss vaccination schedules with your hematologist and/or pediatrician.[6]

Adjunctive therapies

Rest, ice, compression and elevation (RICE) can be used in addition to drug treatment to help bleeds or injuries resolve more quickly.

REST
To reduce the risk of re-bleeding, protect the joint from repeat injury by resting the affected joint and limiting activity.[7]

ICE
Apply ice packs to bruises or swelling. Ice can limit the extent of bleeding in a joint and help decrease pain and swelling.[8]

COMPRESSION
Compression of the affected joint not only helps alleviate pain, but also aids in improving joint function.

ELEVATION
Elevating the joint helps minimize swelling because it aids in the reabsorption of collected fluid.

HIV concerns

The last transmission of HIV by a factor product made in the United States occurred in 1987.[4] Everyone who has received blood products in the past should be tested for transmissible viral infections such as HIV and hepatitis A, B and C. If you have tested positive for any of these, then please seek appropriate counseling, support and medical follow-up.

Pain management

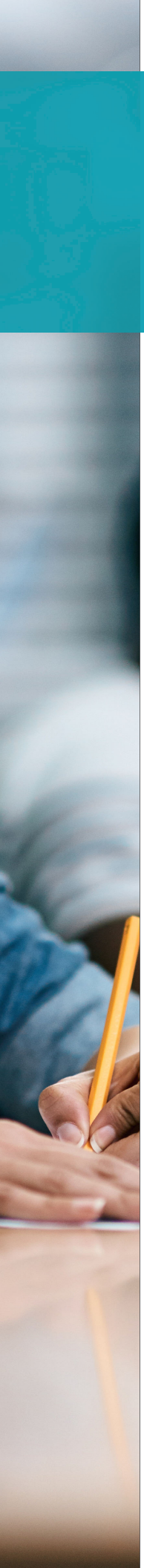
You should not take nonsteroidal anti-inflammatory drugs (NSAIDs) like aspirin or ibuprofen without talking to your doctor. Use caution and read labels carefully before taking over-the-counter (OTC) medications because many products contain several active ingredients including aspirin (sometimes listed as ASA or acetylsalicylic acid) or ibuprofen.

Most people who have VWD can take acetaminophen for pain relief because it does not interfere with how your platelets work. If you have ever been told that you have liver disease or damage, discuss acetaminophen with your healthcare provider before use.

Before using any OTC medicine, it's wise to consult your pharmacist, healthcare practitioner or prescriber.[9]

When should you disclose health status?

If your child has von Willebrand disease that is severe enough to pose a significant risk of bleeding, your doctor may advise you to inform your child's caretakers or school personnel. When staff such as the school nurse, teacher, daycare provider, coach or leader of after-school activities know about and are aware of the best actions to take, they can respond appropriately if your child is injured. Your treatment center and specialty pharmacy can help provide education.[1]



Frequently asked questions

I have heavy periods. What can I do?

Very heavy or prolonged menstrual bleeding is a common symptom in women with VWD. Women in families where VWD has not been identified and whose mothers have had heavy or really long menstrual periods may think their periods are normal; this is a common misconception. To avoid having a hysterectomy as a remedy when medicine may be available to control bleeding, it's important to be evaluated by a gynecologist who may send you to a hematologist to determine whether you have a bleeding disorder.

Your gynecologist should keep in touch with your hematologist to coordinate therapy. Birth control pills are usually the first recommendation by doctors to treat excessive menstrual bleeding. Tranexamic acid (Lysteda) is FDA-approved to treat heavy menstrual periods. Desmopressin and factor products containing VWF can also be used treat heavy periods to decrease the flow or the length of the period. Occasionally, both forms of therapy may be used.

All women with VWD should consult a gynecologist regularly.

Will I have trouble having a baby?

Women with the mildest forms of VWD often have an increase in their von Willebrand factor to normal levels during pregnancy, but return to baseline level very quickly after childbirth.

Women with more severe bleeding symptoms, such as those with type 2 and type 3 VWD, may have an increase in the levels of von Willebrand factor, but they don't usually reach normal levels so may require infusion of factor for childbirth.

Due to extremely rapid decreases in von Willebrand factor after childbirth, all women with WVD should be monitored closely during the immediate post-partum period as they usually need treatment during childbirth. Women with VWD are also at risk for postpartum hemorrhage that may be delayed.[3] It's important to consult a hematologist early in the pregnancy to monitor your bleeding disorder.

Women with VWD can get pregnant and have healthy babies.

I tend to have nosebleeds. What should I do?

Nosebleeds are a common symptom of VWD. To slow the bleeding, pinch your nose at the bridge, close to where glasses might sit. Tilt your head down and put an ice pack on your nose. Many people have good results using an over-the-counter topical powder that inhibits bleeding when applied directly to the nostril with a special swab. To prevent nosebleeds from occurring, you may want to use saline nasal spray or gel once a day and use a humidifier year-round.[10] Talk with your pharmacist or health care provider if you have additional questions.

How should I prepare for emergencies?

Since emergency room staff may not be familiar with VWD, you should carry a letter from your doctor or a wallet card about your bleeding disorder and treatment, including choice of treatment and dose. It's also important to provide the telephone numbers of your hematologist and hemophilia treatment center. Wear a medical alert ID bracelet or necklace in case you are unable to speak for yourself.

Accredo can provide, upon request, a window cling and emergency care card for your glovebox. These may be used to alert first responders about your bleeding disorder in the unlikely event that you are unable to speak during an emergency. Ask your Accredo customer service agent for these items in your next shipment.

IF YOU REQUIRE TREATMENT WITH FACTOR PRODUCTS OR STIMATE, TAKE A SUPPLY WHEN YOU TRAVEL BECAUSE MANY HOSPITALS DON'T KEEP THEM IN STOCK.

Is von WIllebrand disease curable?

No, VWD is an inherited, lifelong bleeding disorder. Obtaining treatment is important to limit bleeding events

Glossary of commonly used terms

Antifibrinolytic drugs
Medicines that help prevent the breakdown of clots that form at bleeding sites.

Arthropathy
Joint disease that may be caused by repeated bleeding into the joints.

Autosomal dominant inheritance pattern
An inheritance pattern in which one parent with the gene passes it to a child. Also known as classical inheritance pattern.

Autosomal recessive inheritance pattern
An inheritance pattern that occurs when the child receives the gene from both parents.

Bleeding episode (bleed)
A collection of blood at a site inside or on the surface of the body that occurs when the person with a bleeding disorder is actively bleeding.

Blood vessel
The part of the body that carries blood to and from all body areas. An artery carries oxygen-rich blood from the heart to the body's tissues; a vein carries blood from the body's tissues back to the heart and lungs to receive more oxygen.

Chronic
Long-lasting or lifelong.

Clot
A jelly-like substance made of a protein, called fibrin, interacting with blood cells called platelets. A clot forms to stop bleeding from a damaged blood vessel.

Coagulation
The process in which liquid blood changes into a jelly-like plug to seal an injured blood vessel and stop bleeding.

Desmopressin
A synthetic version of a natural hormone made by the pituitary gland. When given to people who can produce some factor VIII or von Willebrand factor, the drug causes a rapid, temporary increase in factor VIII and VWF in the blood.

Factor concentrate
A freeze-dried powder product that contains measured amounts of a particular clotting factor, such as factor VIII or factor IX. To treat VWD, clotting factor should list ristocetin cofactor activity (RCof) units.

Hematologist
A doctor who specializes in the treatment of diseases of the blood.

Hemophilia treatment center (HTC)
A nationwide network of specialized treatment facilities where a team of healthcare providers (doctors, nurses, social workers, physical therapists and other disciplines) work together to deliver comprehensive care for people with bleeding disorders and their families.

Home therapy
Administration of prescribed medication, usually intravenously infused or injected, in the home by the patient, a caregiver or a nurse.

Inflammation
The body's defensive reaction to injury or irritation. Symptoms include swelling, heat, redness and pain. In people with a bleeding disorder, inflammation may occur in response to a bleeding episode.

Intravenous infusion
Giving a medicine into a vein.

Joint
A place in the body where two or more bones come together.

Joint bleed
When a bleed occurs in a joint; also called hemarthrosis.

Multimers
Part of the structure of the VWF molecule. High molecular weight multimers are needed to help form blood clots.

NSAID
Abbreviation for nonsteroidal anti-inflammatory drugs that include aspirin and ibuprofen.

Plasma
Liquid portion of the blood that contains clotting proteins.

Platelet
Disc-shaped blood cells needed for clotting.

Recombinant
Artificially produced protein.

RICE
Complementary treatment for bleeding episodes used in addition to factor therapy. The letters stand for rest, ice, compression and elevation of the injured area.

Ristocetin cofactor (RCof)
A unit that measures the activity of VWF.

Specialty pharmacy
A company that provides factor products and infusion supplies to support home treatment of bleeding disorders. Specialty pharmacies may also provide other services to assist patients in adhering to the treatment plan prescribed by their healthcare practitioner or HTC.

Synthetic
A manmade chemical made in a laboratory rather than from a natural source.

Focused Care for
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Leslie, RN
Bleeding Disorders Educator

Accredo at a glance

Our bleeding disorder-trained team is focused on treating you and understands how to help manage your condition.

16
Pharmacists & pharmacy techs

550+
Field nurses

24/7
Clinician access

14
Patient care representatives

27
Field patient advocates

30
Insurance representatives

We're here for you: hemophilia.com or 866.712.5200

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After reading through Living with von Willebrand disease, can you answer the following questions?

What happens when you have von Willebrand disease?
See page 3

What are the different types of von Willebrand disease?
See page 4

What tests are used to diagnose von Willebrand disease?
See page 5

What treatment is recommended for von Willebrand disease?
See page 7

What issues do women with von Willebrand disease face?
See page 13

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