



Rituximab (Rituxan®)

Pronounce: ri-TUK-si-mab

Classification: Monoclonal Antibody

About Rituximab (Rituxan®)

Monoclonal antibodies are created in a lab to attach to the targets found on specific types of cancer cells. The antibody “calls” the immune system to attack the cell it is attached to, resulting in the immune system killing the cell. These antibodies can work in different ways, including stimulating the immune system to kill the cell, blocking cell growth or other functions necessary for cell growth. Rituximab is directed against a protein called CD20, found on the surface of normal and cancerous B-cells, which are part of the immune system. Once rituximab attaches itself to the B cells expressing CD20, it summons the body's immune system to attack and destroy those cells.

How to Take Rituximab

Rituximab is given by intravenous (IV, into a vein) infusion. It may take several hours or longer to receive your first dose of rituximab. Depending on how you tolerate the medication, you may receive subsequent doses more quickly. The dosage and schedule are determined by the person's body size, type of cancer, and treatment regimen. Prior to each dose, the patient may be given medications, including acetaminophen and an antihistamine (such as diphenhydramine), to decrease the risk of an infusion reaction.

You, or anyone you live with, should avoid having live or live-attenuated vaccines while receiving this medication. These include herpes zoster (Zostavax) for shingles prevention, oral polio, measles, nasal flu vaccine (FluMist®), rotavirus, and yellow fever vaccines.

Possible Side Effects of Rituximab

There are a number of things you can do to manage the side effects of rituximab. Talk to your care team about these recommendations. They can help you decide what will work best for you. These are some of the most common or important side effects:

Infusion and Allergic Reactions

Allergic or infusion reactions may occur during the treatment, typically within 30 minutes to 2 hours of beginning the first infusion. This is less common after the first treatment.

During the infusion, if you experience difficulty breathing or swallowing, experience chest pain, cough or wheezing, swelling of lips or face, develop itching, rash or hives, lightheadedness, fever, chills, or shakes inform your nurse immediately. Additional medications may be given to alleviate your discomfort. Your infusion may be slowed or temporarily stopped.

Severe Skin and Mouth Reactions

Notify your healthcare provider if you develop painful sores or blisters, on your skin, lips, or inside your mouth, rash or peeling skin.

Hepatitis B Reactivation

This medication can also cause Hepatitis B reactivation in patients who have previously had hepatitis. Be sure your healthcare provider is aware of previous Hepatitis B diagnosis and treatment. You will also be tested for the Hepatitis B virus prior to beginning treatment with this medication.

Progressive Multifocal Leukoencephalopathy (PML)

Progressive Multifocal Leukoencephalopathy (PML) is a rare but very serious brain infection that has been reported with this medication. The signs of PML may develop over several weeks or months. They may include changes in mood or usual behavior, confusion, thinking problems, loss of memory, changes in vision, speech, or walking, and decreased strength or weakness on one side of the body. If you develop any of these signs, notify your oncology care team immediately.

Infection and Low White Blood Cell Count (Neutropenia)

White blood cells (WBC) are important for fighting infection. While receiving treatment, your [WBC count can drop](#), putting you at a higher risk of getting an infection. You should let your doctor or nurse know right away if you have a fever (temperature greater than 100.4°F or 38°C), sore throat or cold, shortness of breath, cough, burning with urination, or a sore that doesn't heal.

Tips to preventing infection:

- [Washing hands](#), both yours and your visitors, is the best way to prevent the spread of infection.
- Avoid large crowds and people who are sick (i.e.: those who have a cold, fever, or cough or live with someone with these symptoms).
- When working in your yard, wear protective clothing including long pants and gloves.
- Do not handle pet waste.
- Keep all cuts or scratches clean.
- Shower or bathe daily and perform frequent [mouth care](#).
- Do not cut cuticles or ingrown nails. You may wear nail polish, but not fake nails.
- Ask your oncology care team before scheduling dental appointments or procedures.
- Ask your oncology care team before you, or someone you live with has any vaccinations.

Fatigue

[Fatigue](#) is very common during cancer treatment and is an overwhelming feeling of exhaustion that is not usually relieved by rest. While on cancer treatment, and for a period after, you may need to adjust your schedule to manage fatigue. Plan times to rest during the day and conserve energy for more important activities. Exercise can help combat fatigue; a simple daily walk with a friend can help. Talk to your healthcare team for helpful tips on dealing with this side effect.

Nausea and/or Vomiting

Talk to your oncology care team so they can prescribe medications to help you manage [nausea and vomiting](#). In addition, dietary changes may help. Avoid things that may worsen the symptoms, such as heavy or greasy/fatty, spicy, or acidic foods (lemons, tomatoes, oranges). Try saltines, or ginger ale to lessen symptoms.

Call your oncology care team if you are unable to keep fluids down for more than 12 hours or if you feel lightheaded or dizzy at any time.

Important but Less Common Side Effects

- ***GI Obstruction or Tear:*** This medication can cause bleeding or a tear in the intestinal wall. Signs of these problems include: unexpected bleeding, blood in the stool or black stools, coughing up blood, vomiting blood, vomit that looks like coffee grounds, fever, severe pain in the abdomen, or new

abdominal swelling. If you experience any of these, contact your oncology care team immediately or go to the emergency room.

- **Flu-Like Symptoms:** You may experience flu-like symptoms, including muscle and body aches, headache, fever, and chills. Acetaminophen may help relieve these symptoms. However, fever can be a sign of an infection and should be reported to your healthcare provider.
- **Tumor Lysis Syndrome:** If there are a large amount of tumor cells in your body prior to treatment, you are at risk for tumor lysis syndrome. This happens when the tumor cells die too quickly and their waste overwhelms the body. You may be given a medication (allopurinol) and IV fluids to help prevent this. If you experience nausea, vomiting, diarrhea, or become lethargic (drowsy, sluggish), notify your oncology team right away. TLS can affect your kidney function. Your provider will monitor your kidney function with blood work. Notify your provider if you have little or no urine output.
- **Heart Problems:** Rituximab can cause chest pain or irregular heartbeats. Notify your healthcare provider if you develop cardiac symptoms.
- **Kidney Problems:** This medication can cause kidney problems, including an increased creatinine level, which your oncology care team may monitor for using blood tests. Notify your healthcare provider if you notice decreased urine output, blood in the urine, swelling in the ankles, or loss of appetite.

Reproductive Concerns

Exposure of an unborn child to this medication could cause birth defects, so you should not become pregnant or father a child while on this medication. Effective birth control is necessary during treatment and for at least 12 months after treatment. Even if your menstrual cycle stops or you believe you are not producing sperm, you could still be fertile and conceive. You should not breastfeed while taking this medication or for 6 months after your last dose.

Current Biosimilars

There are biosimilar versions of rituximab. A biosimilar is a medication that has been approved by the FDA because it is very similar to an FDA-approved medication (called a reference product, or the medication it is being compared to), and there are no meaningful differences between the biosimilar product and the reference product. These medications may be used interchangeably.

The biosimilar versions of this medication include rituximab-abbs, rituximab-arrx, and rituximab-pvvr.

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