

## Bevacizumab (Avastin®)

**Pronounce:** BEV-a-SIZ-oo-mab

**Classification:** Monoclonal Antibody

### About Bevacizumab (Avastin®)

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.

Bevacizumab is a monoclonal antibody that binds to and inhibits the activity of vascular endothelial growth factor (VEGF). This prevents the VEGF from interacting with its receptor on endothelial cells (lining of blood vessel). This, in turn, inhibits the formation of new blood vessels, which slows down the growth of the particular tissue. In essence, it kills tumors by cutting off their blood supply.

### How to Take Bevacizumab (Avastin®)

Bevacizumab is given by intravenous (IV, into a vein) infusion. The amount of time the infusion will take will depend on your treatment plan and if you tolerate the medication. Dosage depends on the person’s size and type of cancer being treated. How often you receive this medication and what other medications you receive will be determined by your care team.

### Possible Side Effects of Bevacizumab (Avastin®)

There are a number of things you can do to manage the side effects of bevacizumab. 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:

#### High Blood Pressure

Patients receiving bevacizumab can develop high blood pressure (hypertension). Your blood pressure should be monitored at every clinic visit or every 2-3 weeks. If your blood pressure is elevated, you may be treated with a medication to reduce your pressure. If severe hypertension develops, bevacizumab should be discontinued immediately. Your blood pressure should continue to be monitored, even if bevacizumab is stopped. Signs of hypertension to report to your team include: blurry vision, nosebleed, headache and fatigue.

#### 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.

#### Bleeding

Patients may experience minor bleeding, such as a nosebleed. Serious bleeding has also occurred in patients treated with this medication, including coughing up blood, bleeding into the stomach, vomiting blood, bleeding

in the brain (stroke), and vaginal bleeding. People who have had serious bleeding should not take this medication. These events are uncommon, though if they occur, bevacizumab should be discontinued. While a nosebleed may not seem like much of a concern, you should notify your healthcare team right away if you develop bleeding of any sort.

## Important but Less Common Side Effects

- **Wound Healing:** This medication can lead to slower or incomplete wound healing, such as a surgical wound not healing or staying closed. Therefore, it is recommended that the medication be discontinued 4 weeks prior to any surgery. In addition, the medication should be held for 28 days after surgery and any surgical incision should be fully healed prior to starting or restarting the medication. If you have a surgical wound that has not healed or begins to have signs of infection (redness, swelling, warmth), report this to your healthcare team.
- **Kidney Damage:** Kidney damage can occur while receiving bevacizumab. Your healthcare team will monitor this by periodically checking the amount of protein in your urine. If the protein levels become elevated, you may require further urine tests to evaluate your kidney function. If your kidneys become damaged, you may need to stop receiving this medication.
- **Blood Clots, Stroke and Heart Attack:** Bevacizumab can increase the risk of blood clots, stroke and heart attack. If you experience symptoms of these problems, you should contact your healthcare provider immediately or go to an emergency room. Symptoms can include: swelling, redness or pain in an extremity, chest pain or pressure, pain in your arm, back, neck or jaw, shortness of breath, numbness or weakness on one side of the body, trouble talking, confusion or mental status changes.
- **Infusion Reactions:** The infusion can cause a reaction that may lead to chills, fever, low blood pressure, nausea and vomiting. Reactions are most common during the first week of therapy, including the evening after the infusion. Let your nurse know if you are feeling any different during your infusion.
- **Gastrointestinal Perforation:** This medication can cause a tear in the intestinal wall, also called a gastrointestinal perforation. Signs of this can include: new or worsening pain in the abdomen, new abdominal swelling, chills, fever, constipation, nausea or vomiting. If you experience any of these, contact your healthcare provider immediately or go to the emergency room.
- **Posterior Reversible Encephalopathy Syndrome (PRES):** In rare cases, this medication has caused a neurological disorder called posterior reversible encephalopathy syndrome (PRES), also called reversible posterior leukoencephalopathy (RPLS). Symptoms of PRES/RPLS include headache, seizure, lethargy, confusion, blindness and other visual and neurological disturbances. Report any of these symptoms to your healthcare team immediately.
- **Fistula:** A possible, but rare, side effect is the development of a fistula, which is an abnormal passage between two body parts (for instance, a hole between the lung and esophagus).
- **Congestive Heart Failure (CHF):** Bevacizumab can cause or worsen pre-existing heart problems, including congestive heart failure. Notify your healthcare provider if you have sudden weight gain or swelling in the ankles or legs. If you develop chest pain or pressure, sweating, shortness of breath, nausea, dizziness or lightheadedness, call 911 or go to the nearest emergency room.

## Sexual & Reproductive Concerns

This drug may affect your reproductive system, resulting in the menstrual cycle or sperm production becoming irregular or stopping permanently. Women may experience menopausal effects including hot flashes and [vaginal dryness](#). In addition, the desire for sex may decrease during treatment. You may want to consider sperm banking or egg harvesting if you may wish to have a child in the future. Discuss these options with your oncology team.

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

6 months after treatment, even if your menstrual cycle stops or you believe you are not producing sperm. You may want to consider sperm banking or egg harvesting if you may wish to have a child in the future. Discuss these options with your oncology team. You should not breastfeed while taking this medication and for 6 months after treatment.

## Current Biosimilars

There are biosimilar versions of bevacizumab. 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 that 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 bevacizumab-awwb (Mvasi), bevacizumab-bvzr (Zirabev®) bevacizumab-tnjn (Avzivi), bevacizumab-adcd (Vegzelma), and bevacizumab-maly (Alymsys).

## Trifluridine and Tipiracil (Lonsurf®)

**Pronounce:** trye-FLURE-i-deen and tye-PIR-a-sil

**Classification:** Trifluridine: nucleoside metabolic inhibitor. Tipiracil: thymidine phosphorylase inhibitor

## About Trifluridine and Tipiracil (Lonsurf®)

Trifluridine is a nucleoside metabolic inhibitor, which means that it affects the DNA synthesis needed for cancer cells to divide. Tipiracil blocks the action of thymidine phosphorylase, an enzyme that is found in many solid tumors. Trifluridine is broken down by thymidine phosphorylase. By blocking trifluridine from being broken down, tipiracil increases its exposure to cancer cells, causing further cell destruction.

## How to take Trifluridine and Tipiracil

Trifluridine and Tipiracil is a combination of two medications in the same tablet, taken by mouth. The dose is based on your weight and will be determined by your provider. It should be taken within one hour of finishing your morning and evening meal. Swallow the tablets whole. If you miss a dose, skip the missed dose and proceed with your normal schedule.

It is important to make sure you are taking the correct amount of medication every time. Before every dose, check that what you are taking matches what you have been prescribed.

If you vomit right after taking a dose, or miss a dose of this medication, do not take additional doses to make up for the vomited or missed dose. Call your provider for instructions about what to do for a missed dose.

You will have lab work drawn to monitor your complete blood count before starting treatment and on day 15 of treatment to closely monitor your ANC, or absolute neutrophil count (infection fighting cells) and your platelet count (needed for blood clotting). Your dose may be adjusted according to your lab results.

## Storage and Handling

Store your medication in the original, labeled container at room temperature and in a dry location (unless otherwise directed by your provider or pharmacist). This medication should not be stored in a pillbox. If you do store this medication outside of the original bottle it came in from pharmacy, throw away any unused tablets after 30 days. Keep containers out of reach of children and pets.

If a caregiver prepares your dose for you, they should consider wearing gloves or pour the pills directly from their container into the cap, a small cup, or directly into your hand. They should avoid touching the pills. They should always wash their hands before and after giving you the medication. Pregnant or nursing women should not prepare the dose for you. Ask your provider where to return any unused medication for disposal. Do not

flush down the toilet or throw in the trash.

## Where do I get this medication?

This medication is available through select specialty pharmacies. Your provider will work with your prescription drug plan to identify an in-network specialty pharmacy for distribution of this medication and shipment directly to your home.

## Insurance Information

This medication may be covered under your prescription drug plan. Co-pay assistance may be available to qualifying individuals with or without prescription drug coverage. Your provider can help you find these resources if they are available.

## Possible Side Effects of Trifluridine and Tipiracil

There are a number of things you can do to manage the side effects of trifluridine and tipiracil. Talk to your provider 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:

### Infection and Low White Blood Cell Count (Leukopenia or Neutropenia)

This medication can cause life threatening infections, with or without a decrease in white blood cell counts.

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 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 provider before scheduling dental appointments or procedures.
- Ask your provider before you, or someone you live with, has any vaccinations.

### Low Red Blood Cell Count (Anemia)

Your red blood cells are responsible for carrying oxygen to the tissues in your body. When the [red cell count is low](#), you may feel tired or weak. You should let your provider know if you have any shortness of breath, difficulty breathing or pain in your chest. If the count gets too low, you may receive a blood transfusion.

### 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 provider for

helpful tips on dealing with this side effect.

## Nausea and/or Vomiting

Talk to your provider 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 provider if you are unable to keep fluids down for more than 12 hours or if you feel lightheaded or dizzy at any time.

## Low Platelet Count (Thrombocytopenia)

Platelets help your blood clot, so when the [count is low](#) you are at a higher risk of bleeding. Let your provider know if you have any excess bruising or bleeding, including nose bleeds, bleeding gums or blood in your urine or stool. If the platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor (an electric razor is fine).
- Avoid contact sports and activities that can result in injury or bleeding.
- Do not take aspirin (salicylic acid), non-steroidal, anti-inflammatory medications (NSAIDs) such as Motrin/Advil (ibuprofen), Aleve (naproxen), Celebrex (celecoxib) etc. as these can all increase the risk of bleeding. Please consult with your provider regarding use of these agents and all over the counter medications/supplements while on therapy.
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

## Decrease in Appetite

[Nutrition](#) is an important part of your care. Cancer treatment can affect your appetite and, in some cases, the side effects of treatment can make eating difficult. Ask your provider about nutritional counseling services at your treatment center to help with food choices.

- Try to eat five or six small meals or snacks throughout the day, instead of 3 larger meals.
- If you are not eating enough, nutritional supplements may help.
- You may experience a metallic taste or find that food has no taste at all. You may dislike foods or beverages that you liked before receiving cancer treatment. These symptoms can last for several months or longer after treatment ends.
- Avoid any food that you think smells or tastes bad. If red meat is a problem, eat chicken, turkey, eggs, dairy products and fish without a strong smell. Sometimes cold food has less of an odor.
- Add extra flavor to meat or fish by marinating it in sweet juices, sweet and sour sauce or dressings. Use seasonings like basil, oregano or rosemary to add flavor. Bacon, ham and onion can add flavor to vegetables.

## Diarrhea

Diarrhea can be a serious side effect that can lead to dehydration. Notify your provider if you develop diarrhea.

Your provider can recommend medications to relieve [diarrhea](#). Also, try eating [low-fiber](#), bland foods, such as white rice and boiled or baked chicken. Avoid raw fruits, vegetables, whole grain breads, cereals and seeds. Soluble fiber is found in some foods and absorbs fluid, which can help relieve diarrhea. Foods high in soluble fiber include: applesauce, bananas (ripe), canned fruit, orange sections, boiled potatoes, white rice, products made with white flour, oatmeal, cream of rice, cream of wheat, and farina. Drink 8-10 glasses of non-alcoholic, un-caffeinated fluid a day to prevent dehydration.

## Liver Changes

This medication can cause liver changes, which your provider may monitor for using blood tests called liver

function tests. Notify your provider if you notice yellowing of the skin or eyes, if your urine appears dark or brown, or if you have pain in your abdomen (belly), as these can be signs of liver toxicity.

## 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. For women, effective birth control is necessary during treatment and for at least 6 months after your last dose. For men, effective birth control is necessary during treatment and for at least 3 months after your last dose. 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 receiving this medication and for at least 1 day after your last dose.

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