



[cancer.org](https://www.cancer.org) | 1.800.227.2345

# Treating Waldenstrom Macroglobulinemia

If you've been diagnosed with Waldenstrom macroglobulinemia, your treatment team will discuss your options with you. It's important to weigh the benefits of each treatment option against the possible risks and side effects.

## How is Waldenstrom macroglobulinemia treated?

If treatment is needed for Waldenstrom macroglobulinemia (WM), several types can be used:

- [Chemotherapy for Waldenstrom Macroglobulinemia](#)
- [Targeted Drugs for Waldenstrom Macroglobulinemia](#)
- [Biological Therapy or Immunotherapy for Waldenstrom Macroglobulinemia](#)
- [Plasmapheresis \(Plasma Exchange\) for Waldenstrom Macroglobulinemia](#)
- [Stem Cell Transplant for Waldenstrom Macroglobulinemia](#)
- [Radiation Therapy for Waldenstrom Macroglobulinemia](#)

## Common treatment approaches

Not everyone with WM needs to be treated right away. People who don't have serious or bothersome symptoms can often be watched closely, and then treated later if needed.

The 2 main ways to treat WM are chemotherapy and different types of biological therapy (immunotherapy). One or both of these types of treatments might be used.

In recent years, much progress has been made in treating people with WM. A number of newer drugs have been found to work against WM, but few studies have compared

them to see which ones are best. Because of this, there is no single standard treatment for all patients.

- [When to Treat People With Waldenstrom Macroglobulinemia](#)

### Who treats Waldenstrom macroglobulinemia?

Based on your treatment options, you might have different types of doctors on your treatment team:

- A **hematologist**: a doctor who treats disorders of the blood, including lymphomas such as WM
- A **medical oncologist**: a doctor who treats cancer with chemotherapy and other medicines
- A **radiation oncologist**: a doctor who treats cancer with radiation therapy

Many other specialists might be part of your treatment team as well, including physician assistants (PAs), nurse practitioners (NPs), nurses, nutrition specialists, social workers, and other health professionals.

- [Health Professionals Associated With Cancer Care](#)<sup>1</sup>

### Making treatment decisions

It's important to discuss all treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. You may feel that you need to make a decision quickly, but it's important to give yourself time to absorb the information you have learned. Ask your cancer care team questions.

If time permits, it is often a good idea to seek a second opinion, particularly for a rare condition such as Waldenstrom macroglobulinemia. A second opinion may give you more information and help you feel more confident about the treatment plan you choose.

- [Questions to Ask About Waldenstrom Macroglobulinemia](#)<sup>2</sup>
- [Seeking a Second Opinion](#)<sup>3</sup>

### Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-the-art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they're not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- [Clinical Trials](#)<sup>4</sup>

### **Considering complementary and alternative methods**

You may hear about alternative or complementary methods that your doctor hasn't mentioned to treat your cancer or relieve symptoms. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods refer to treatments that are used along with your regular medical care. Alternative treatments are used instead of a doctor's medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be harmful.

Be sure to talk to your cancer care team about any method you are thinking about using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision.

- [Complementary and Alternative Medicine](#)<sup>5</sup>

### **Help getting through cancer treatment**

People with cancer need support and information, no matter what stage of illness they may be in. Knowing all of your options and finding the resources you need will help you make informed decisions about your care.

Whether you are thinking about treatment, getting treatment, or not being treated at all, you can still get supportive care to help with pain or other symptoms. Communicating with your cancer care team is important so you understand your diagnosis, what treatment is recommended, and ways to maintain or improve your quality of life.

Different types of programs and support services may be helpful, and can be an

important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services – including rides to treatment, lodging, and more – to help you get through treatment. Call our National Cancer Information Center at 1-800-227-2345 and speak with one of our trained specialists.

- [Palliative Care](#)<sup>6</sup>
- [Find Support Programs and Services in Your Area](#)<sup>7</sup>

### **Choosing to stop treatment or choosing no treatment at all**

For some people, when treatments have been tried and are no longer controlling the cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors and you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

- [If Cancer Treatments Stop Working](#)<sup>8</sup>

*The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.*

---

## **Chemotherapy for Waldenstrom Macroglobulinemia**

Chemotherapy (chemo) uses anti-cancer drugs that are taken by mouth, or injected into a vein, a muscle, or under the skin. These drugs enter the bloodstream and reach almost all areas of the body, making this treatment very useful for Waldenstrom macroglobulinemia (WM).

Chemo is given in cycles. A period of treatment is followed by a rest period to allow the body time to recover. Each chemo cycle generally lasts for several weeks. Most chemo treatments are given on an outpatient basis (in the doctor's office, clinic, or hospital outpatient department).

Many types of chemo drugs can be used to treat patients with WM:

### **Alkylating agents**

- Cyclophosphamide (Cytosan<sup>®</sup>)
- Bendamustine (Treanda<sup>®</sup>)

### **Purine analogs**

- Fludarabine (Fludara<sup>®</sup>)
- Cladribine (2-CdA, Leustatin<sup>®</sup>)

### **Corticosteroids**

- Prednisone
- Dexamethasone (Decadron<sup>®</sup>)

### **Other chemo drugs**

- Vincristine (Oncovin<sup>®</sup>)
- Doxorubicin (Adriamycin<sup>®</sup>)

Chemo drugs may be used alone or combined with other drugs, such as targeted drugs or immunotherapy drugs. (For a list of some common combinations used in WM, see [When to Treat People With Waldenstrom Macroglobulinemia.](#))

### **Chemo side effects**

Chemo drugs attack cells that are dividing quickly, which is why they work against WM

cells. But other cells in the body, such as those in the bone marrow (where new blood cells are made), the lining of the mouth and intestines, and the hair follicles, also divide quickly. These cells are also likely to be affected by chemotherapy, which can lead to certain side effects.

The [side effects](#)<sup>1</sup> of chemo depend on which drugs are used, the doses, and the length of time they are taken. Common side effects include:

- [Nausea and vomiting](#)<sup>2</sup>
- [Loss of appetite](#)<sup>3</sup>
- [Hair loss](#)<sup>4</sup>
- [Mouth sores](#)<sup>5</sup>
- [Diarrhea](#)<sup>6</sup> or [constipation](#)<sup>7</sup>
- Increased risk of [infections](#)<sup>8</sup> (from having too few white blood cells)
- Problems with [bleeding or bruising](#)<sup>9</sup> (from having too few blood platelets)
- [Fatigue](#)<sup>10</sup> (tiredness) and shortness of breath (from having too few red blood cells)

Other side effects can be seen with certain drugs. For example, doxorubicin can damage the heart. Corticosteroid drugs can cause problems sleeping and an increased appetite.

If you have side effects, your cancer care team can suggest steps to ease them. For example, medicines can be taken to help prevent and control nausea and vomiting. Most side effects are temporary and go away after treatment is finished. If you have serious side effects, the chemo may have to be reduced or stopped, at least temporarily.

### **Long-term side effects of chemotherapy**

Some chemo drugs cause long-term side effects that can affect almost any part of the body. One of the most serious complications with certain chemo drugs is the possibility of developing leukemia later on. It affects a very small percentage of patients, but it is more common in patients who take fludarabine or alkylating agents.

For more detailed information, see [Chemotherapy](#)<sup>11</sup>.

### **Hyperlinks**

1. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-)

- [effects/nausea-and-vomiting.html](#)
3. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/eating-problems/poor-appetite.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/eating-problems/poor-appetite.html)
  4. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/hair-loss.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/hair-loss.html)
  5. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/mouth-problems/mouth-sores.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/mouth-problems/mouth-sores.html)
  6. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/stool-or-urine-changes/diarrhea.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/stool-or-urine-changes/diarrhea.html)
  7. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/stool-or-urine-changes/constipation.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/stool-or-urine-changes/constipation.html)
  8. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/infections/infections-in-people-with-cancer.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/infections/infections-in-people-with-cancer.html)
  9. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/bleeding.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/bleeding.html)
  10. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html)
  11. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html)

## References

Buske C, Leblond V, Dimopoulos M, et al. Waldenstrom's macroglobulinaemia: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol*. 2013;24 Suppl 6:vi155–159.

Gertz MA. Waldenström macroglobulinemia: 2017 update on diagnosis, risk stratification, and management. *Am J Hematol*. 2017;92:209-217.

National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in Oncology: Waldenstrom's macroglobulinemia/Lymphoplasmacytic lymphoma. V.1.2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/waldenstroms.pdf](http://www.nccn.org/professionals/physician_gls/pdf/waldenstroms.pdf) on June 21, 2018.

Rajkumar SV, Dispenzieri A. Chapter 104: Multiple myeloma and related disorders. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014.

See all references for Waldenstrom Macroglobulinemia  
([www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html](http://www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html))

Last Medical Review: July 19, 2018 Last Revised: July 19, 2018

---

## Targeted Drugs for Waldenstrom Macroglobulinemia

As researchers have learned more about the changes inside cells that cause cancer, they have developed newer drugs that target these changes. They are often referred to as targeted therapy. These drugs work differently from standard [chemotherapy](#) (chemo) drugs. They sometimes work when chemo drugs don't, and they often have different (and less severe) side effects.

### Proteasome inhibitors

These drugs stop enzyme complexes (proteasomes) inside cells from breaking down proteins that normally help keep cell division under control.

**Bortezomib (Velcade®)** and **carfilzomib (Kyprolis®)** are often used to treat [multiple myeloma](#)<sup>1</sup>. They have also been found to be helpful in some cases of WM. These drugs are given as an infusion into a vein (IV); bortezomib can also be given as an injection under the skin (sub-q).

Although these drugs work slightly differently from most chemo drugs, they can still cause many of the same types of [side effects](#)<sup>2</sup>, including low blood counts, nausea, and loss of appetite. They can also damage nerves, causing pain in the feet and legs (peripheral neuropathy). The nerve damage usually gets better after the drug is stopped, but it might not go away completely.

### mTOR inhibitors

These drugs block a cell protein known as mTOR, which normally helps cells grow and divide into new cells.

**Everolimus (Afinitor®)** is used more often to treat some other types of cancer, but it



has also been shown to be useful in treating WM after other treatments have been tried. This drug is taken daily as a pill. Common side effects include fatigue (tiredness), mouth pain, rash, diarrhea, and infections.

Other mTOR inhibitors, such as **temsirolimus (Torisel®)**, are now being studied to see if they can help treat WM as well.

### **Bruton tyrosine kinase (BTK) inhibitors**

**Ibrutinib (Imbruvica®)** blocks a protein called Bruton tyrosine kinase (BTK) inside lymphoma cells, which normally helps the cells grow and survive. This drug can be used alone to treat WM, or in combination with rituximab . Ibrutinib is taken by mouth, once a day. Common side effects include diarrhea or constipation, nausea and vomiting, fatigue, swelling, decreased appetite, and low blood counts.

Other drugs that block BTK or other kinases in lymphoma cells are also being studied for use against WM (see [What's New in Waldenstrom Macroglobulinemia Research ?<sup>3</sup>](#)).

### **Hyperlinks**

1. [www.cancer.org/cancer/multiple-myeloma.html](http://www.cancer.org/cancer/multiple-myeloma.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)
3. [www.cancer.org/cancer/waldenstrom-macroglobulinemia/about/new-research.html](http://www.cancer.org/cancer/waldenstrom-macroglobulinemia/about/new-research.html)

### **References**

Advani RH, Buggy JJ, Sharman JP, et al. Bruton tyrosine kinase inhibitor ibrutinib (PCI-32765) has significant activity in patients with relapsed/refractory B-cell malignancies. *J Clin Oncol*. 2013;31:88–94.

Buske C, Leblond V, Dimopoulos M, et al. Waldenstrom's macroglobulinaemia: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol*. 2013;24 Suppl 6:vi155–159.

Dimopoulos MA et al. Phase 3 Trial of Ibrutinib plus Rituximab in Waldenström's Macroglobulinemia. *N Engl J Med*. 2018; 378:2399-2410.

Gertz MA. Waldenström macroglobulinemia: 2017 update on diagnosis, risk stratification, and management. *Am J Hematol*. 2017;92:209-217.

Ghobrial IM, Witzig TE, Gertz M, et al. Long-term results of the phase II trial of the oral mTOR inhibitor everolimus (RAD001) in relapsed or refractory Waldenstrom Macroglobulinemia. *Am J Hematol*. 2014;89:237–242.

National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in Oncology: Waldenstrom’s macroglobulinemia/Lymphoplasmacytic lymphoma. V.1.2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/waldenstroms.pdf](http://www.nccn.org/professionals/physician_gls/pdf/waldenstroms.pdf) on June 21, 2018.

Rajkumar SV, Dispenzieri A. Chapter 104: Multiple myeloma and related disorders. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff’s Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014.

See all references for Waldenstrom Macroglobulinemia ([www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html](http://www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html))

Last Medical Review: July 19, 2018 Last Revised: July 19, 2018

---

## Biological Therapy or Immunotherapy for Waldenstrom Macroglobulinemia

Biological therapies help the body’s immune system fight the cancer or use man-made versions of substances normally made by the immune system. These substances can kill Waldenstrom macroglobulinemia (WM) cells or slow their growth.

### Monoclonal antibodies

Antibodies are proteins made by the immune system to help fight infections. Man-made versions, called **monoclonal antibodies**, can be designed to attack a specific target, such as a substance on the surface of lymphocytes (the cells in which WM starts).

**Rituximab (Rituxan)** is the most widely used monoclonal antibody for WM. It attaches to a protein called CD20 on the surface of lymphoma cells . This attachment tells the lymphoma cell to die. Patients get rituximab by infusion into a vein (IV) at the doctor’s office or clinic. Rituximab can be given alone or with chemotherapy or targeted therapy (or other drugs) as a part of treatment.

This drug has to be given carefully to WM patients because sometimes it can actually raise the level of IgM in the blood at first, which can lead to problems with hyperviscosity (thickened blood). Side effects during the infusion are common, and can include chills, fever, nausea, rashes, fatigue, and headaches. Unlike regular chemotherapy, rituximab does not cause low blood counts or hair loss.

**Ofatumumab (Arzerra)** is another antibody that targets the CD20 antigen. It can be used for people who have trouble taking rituximab. Side effects are similar to those seen with rituximab, including an increased risk of IgM levels going up when the drug is first given.

**Alemtuzumab (Campath)** is directed at a different protein on lymphoma cells called CD52. This drug is more commonly used to treat patients with [chronic lymphocytic leukemia](#)<sup>1</sup>, but it also helps some patients with WM. It is given by infusion into a vein (IV) or under the skin, usually 3 times a week. A serious side effect of alemtuzumab is a large drop in blood cell counts that can last weeks or even months. People on this drug can develop life-threatening infections that are hard to treat while their white blood cells are low. Rare but serious side effects can include strokes, as well as tears in the blood vessels in the head and neck.

### Immunomodulating drugs

Immunomodulating drugs (IMiDs) are thought to work against certain cancers by boosting parts of your immune system, although exactly how they work is not clear. These drugs are most often used to treat [multiple myeloma](#)<sup>2</sup>, but they might also be helpful in treating WM.

**Thalidomide (Thalomid)** is the IMiD with the most evidence showing it can help some patients with WM. But many patients have trouble tolerating some of the side effects of this drug. These include drowsiness, fatigue (tiredness), severe constipation, and [neuropathy](#)<sup>3</sup> (painful nerve damage). The neuropathy might not go away after the drug is stopped. There is also an increased risk of serious blood clots that start in the leg and can travel to the lungs. The best results with thalidomide in WM have been seen when it is given along with other drugs, such as rituximab or [dexamethasone](#)<sup>4</sup>.

**Pomalidomide (Pomalyst)** is a newer IMiD that generally cause less severe side effects than thalidomide. It is used mainly to treat multiple myeloma, but studies are now looking at whether it can help treat WM as well.

Because of concerns these drugs can cause severe birth defects if taken during pregnancy, they can only be obtained through special programs run by the drug company that makes them.

## Cytokines

Cytokines are hormone-like proteins normally made by white blood cells to help your immune system fight infections.

**Interferon** is a cytokine that can be made in the lab and given to patients. Some studies have suggested that interferon can make some lymphoma tumors shrink. Side effects of this treatment include moderate to severe fatigue, fever, chills, headaches, muscle and joint aches, and mood changes.

It is still not certain whether interferon is a good option for patients with WM. It is most often used only in patients who continue to get sicker after treatment with other drugs.

For more on biologic treatments and immunotherapies for cancer, see [Cancer Immunotherapy](#)<sup>5</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/chronic-lymphocytic-leukemia.html](http://www.cancer.org/cancer/chronic-lymphocytic-leukemia.html)
2. [www.cancer.org/cancer/multiple-myeloma.html](http://www.cancer.org/cancer/multiple-myeloma.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/peripheral-neuropathy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/peripheral-neuropathy.html)
4. [www.cancer.org/treatment/treatments-and-side-effects/cancer-drugs.html](http://www.cancer.org/treatment/treatments-and-side-effects/cancer-drugs.html)
5. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html)

## References

Buske C, Leblond V, Dimopoulos M, et al. Waldenstrom's macroglobulinaemia: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol*. 2013;24 Suppl 6:vi155–159.

Gertz MA. Waldenström macroglobulinemia: 2017 update on diagnosis, risk stratification, and management. *Am J Hematol*. 2017;92:209-217.

Mazzucchelli M., Frustaci A.M., Deodato M., Cairoli R., Tedeschi A. Waldenstrom's macroglobulinemia: an update. *Mediterr J Hematol Infect Dis* 2018, 10(1): e2018004, DOI: <http://dx.doi.org/10.4084/MJHID.2018.004>

National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in

Oncology: Waldenstrom's macroglobulinemia/Lymphoplasmacytic lymphoma. V.1.2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/waldenstroms.pdf](http://www.nccn.org/professionals/physician_gls/pdf/waldenstroms.pdf) on June 21, 2018.

Rajkumar SV, Dispenzieri A. Chapter 104: Multiple myeloma and related disorders. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014.

See all references for Waldenstrom Macroglobulinemia ([www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html](http://www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html))

Last Medical Review: July 19, 2018 Last Revised: November 30, 2018

---

## Plasmapheresis (Plasma Exchange) for Waldenstrom Macroglobulinemia

If the level of abnormal IgM protein in the blood gets very high in a patient with Waldenstrom macroglobulinemia (WM), the blood becomes very thick (viscous). This is called **hyperviscosity syndrome** and can lead to brain damage (like a stroke) and bleeding problems. When this happens, the level of IgM needs to be lowered right away.

Plasmapheresis (also known as **plasma exchange**) uses a machine to separate the plasma (the liquid part of blood) that contains the abnormal IgM protein from the blood cells. The plasma containing the abnormal protein is discarded, while the blood cells are mixed with salt solution and plasma from a donor and given back to the patient.

Plasmapheresis is done over a few hours while the person lies in a bed or sits in a reclining chair. The blood is removed through an IV line (usually in a vein in the arm), goes through the machine where the plasma is replaced, and then is returned to the body through another IV line. Sometimes, minor surgery is done before the procedure to put a single large catheter in a large vein just below the neck or under the collar bone instead of using IV lines in the arms. This type of catheter, called a [central line or central venous catheter \(CVC<sup>1</sup>\)](#), has both IVs built in.

Plasmapheresis is not painful (aside from the IV lines being put in), but it can be hard to

stay sitting or lying down in the same place for 2 or 3 hours. Calcium levels can drop in some people during treatment, causing numbness and tingling (especially in the hands and feet and around the mouth) and muscle spasms, which can sometimes be painful. This can be treated by giving the patient calcium.

Plasmapheresis works quickly to bring down the IgM level. However, it does not treat the cause of the high IgM level (the cancer cells themselves), so it will go back up again without further treatment (like chemotherapy). Plasmapheresis is usually given to help the patient until chemotherapy or other drugs have a chance to work. It can also be used in people whose WM is not controlled by other [treatments](#).

## Hyperlinks

1. [www.cancer.org/treatment/treatments-and-side-effects/central-venous-catheters.html](http://www.cancer.org/treatment/treatments-and-side-effects/central-venous-catheters.html)

## References

Buske C, Leblond V, Dimopoulos M, et al. Waldenstrom's macroglobulinaemia: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol*. 2013;24 Suppl 6:vi155–159.

Gertz MA. Waldenström macroglobulinemia: 2017 update on diagnosis, risk stratification, and management. *Am J Hematol*. 2017;92:209-217.

Mazzucchelli M., Frustaci A.M., Deodato M., Cairoli R., Tedeschi A. Waldenstrom's macroglobulinemia: an update. *Mediterr J Hematol Infect Dis* 2018, 10(1): e2018004, DOI: <http://dx.doi.org/10.4084/MJHID.2018.004>

National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in Oncology: Waldenstrom's macroglobulinemia/Lymphoplasmacytic lymphoma. V.1.2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/waldenstroms.pdf](http://www.nccn.org/professionals/physician_gls/pdf/waldenstroms.pdf) on June 21, 2018.

Rajkumar SV, Dispenzieri A. Chapter 104: Multiple myeloma and related disorders. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014.

See all references for Waldenstrom Macroglobulinemia ([www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html](http://www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html))

Last Medical Review: July 19, 2018 Last Revised: July 19, 2018

## Stem Cell Transplant for Waldenstrom Macroglobulinemia

The doses of chemotherapy (chemo) drugs (and radiation) doctors can give are limited by the [side effects](#)<sup>1</sup> they can cause. Higher doses can't be used, even if they might kill more cancer cells, because they would severely damage the bone marrow, where new blood cells are made. This could lead to life-threatening infections, bleeding, and other problems due to low blood cell counts. Doctors can try to get around this problem by giving an infusion of blood-forming stem cells after treatment. These stem cells settle in the bone marrow, where they can create new blood cells.

A [stem cell transplant \(SCT\)](#)<sup>2</sup> is not a common treatment for Waldenstrom macroglobulinemia (WM), but it might be an option in younger patients for whom other treatments are no longer working.

Blood-forming stem cells used for a transplant come either from the blood or from the bone marrow. Bone marrow transplants were more common in the past, but they have largely been replaced by stem cells taken from the blood.

The blood-forming stem cells can come either from the patient (called an **autologous** SCT) or from a donor (called an **allogeneic** SCT).

### Autologous stem cell transplant

Most transplants in people with WM are autologous. The patient's own blood-forming stem cells are removed from their bloodstream and stored to use later. Then the patient is given high doses of chemo (and sometimes radiation) to kill the WM cells. The high doses of chemo kill the normal bone marrow cells as well as the cancer cells. After chemo, the frozen stem cells are thawed and returned to the body (like a blood transfusion).

Autologous transplants can help some people with WM, but doctors are still trying to figure out which patients will benefit the most.



## Allogeneic stem cell transplant

This is a treatment that is still being studied for WM, and experts recommend it be done only as part of a [clinical trial](#)<sup>3</sup>.

In an allogeneic SCT, the stem cells for the transplant come from someone else (a donor). The donor's tissue type (also known as the HLA type) needs to match the patient's tissue type as closely as possible to help prevent the risk of major problems with the transplant. Usually this donor is a brother or sister if they have the same tissue type as the patient. If there are no siblings with a good match, the cells may come from an HLA-matched, unrelated donor – a stranger who has volunteered to donate cells.

The stem cells for an allogeneic SCT are usually collected from a donor's bone marrow or blood on several occasions. Regardless of the source, the stem cells are then frozen and stored until they are needed for the transplant.

Allogeneic transplants have more risks and side effects than autologous transplants, so patients typically need to be younger and relatively healthy to be good candidates. Another challenge is that it can sometimes be difficult to find a matched donor.

One of the most serious complications of allogeneic SCTs is known as **graft-versus-host disease (GVHD)**. It happens when the patient's immune system is taken over by that of the donor. When this happens, the donor immune system may consider the patient's own body tissues to be foreign and attacks them.

Symptoms of GVHD can include severe skin rashes, itching, mouth sores (which can affect eating), nausea, and severe diarrhea. Liver damage can cause yellowing of the skin and eyes (jaundice). The lungs can also be damaged. The patient may also become easily tired and develop muscle aches. Sometimes GVHD can become disabling, and if it is severe enough, it can be life-threatening.

**Non-myeloablative transplant:** In this newer approach to allogeneic SCT (also called a **mini-transplant**), lower doses of chemo or radiation therapy are used than in a traditional allogeneic SCT. Patients are given drugs to suppress their immune system. This allows the donor cells to grow and partly take over the patient's immune system. The donor cells then begin attacking the WM cells (known as a **graft-versus-lymphoma** effect).

This type of transplant may be an option for some patients who couldn't tolerate a regular allogeneic transplant because it would be too toxic. Most of the side effects with this type of transplant are less severe than with a standard allogeneic transplant. But this type of transplant can still cause GVHD, which can make patients very sick.



Doctors are trying to refine this treatment to work against the WM cells without affecting the normal cells.

### **Possible side effects of stem cell transplant**

Side effects from a stem cell transplant are generally divided into early and long-term effects.

**Early or short-term effects:** The early complications and side effects are basically the same as those caused by any other type chemotherapy, but they tend to be more severe.

One of the most common and serious short-term effects is the increased risk of [infection](#)<sup>4</sup>. Antibiotics are often given to try to keep this from happening. Other side effects, like low red blood cell and platelet counts, may require [blood product transfusions](#)<sup>5</sup> or other treatments.

A possible side effect of allogeneic transplants is graft-versus-host disease, which is described above.

**Long-term side effects:** Some complications and side effects can remain for a long time or might not occur until months or years after the transplant. These include:

- Loss of fertility
- Damage to the thyroid gland
- Cataracts (damage to the lens of the eye)
- Damage to the lungs, causing shortness of breath
- Bone damage called aseptic necrosis (If damage is severe, the patient might need to have part of the affected bone and the joint replaced.)
- Development of another cancer (such as leukemia) years later

For more about stem cell transplants, see [Stem Cell Transplant for Cancer](#)<sup>6</sup>.

### **Things to consider before having a stem cell transplant**

A stem cell transplant is a complex treatment that can cause life-threatening side effects because of the high doses of chemotherapy used. Be sure you understand the possible benefits and risks. If the doctors think you might benefit from a transplant, it should be done at a hospital where the staff has experience with the procedure and with managing the recovery. Some stem cell transplant programs might not have experience in certain

types of transplants, especially transplants from unrelated donors.

SCTs often require a long hospital stay and can be very expensive (costing well over \$100,000). Because some insurance companies might view it as an experimental treatment, they might not pay for it. Even if the transplant is covered by your insurance, your co-pays or other costs could easily amount to tens of thousands of dollars. Find out what your insurer will cover before deciding on a transplant so you will have an idea of what you might have to pay.

## Hyperlinks

1. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/stem-cell-transplant.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/stem-cell-transplant.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
4. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/infections.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/infections.html)
5. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/blood-transfusion-and-donation.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/blood-transfusion-and-donation.html)
6. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/stem-cell-transplant.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/stem-cell-transplant.html)

## References

Buske C, Leblond V, Dimopoulos M, et al. Waldenstrom's macroglobulinaemia: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol*. 2013;24 Suppl 6:vi155–159.

Gertz MA. Waldenström macroglobulinemia: 2017 update on diagnosis, risk stratification, and management. *Am J Hematol*. 2017;92:209-217.

Mazzucchelli M., Frustaci A.M., Deodato M., Cairoli R., Tedeschi A. Waldenstrom's macroglobulinemia: an update. *Mediterr J Hematol Infect Dis* 2018, 10(1): e2018004, DOI: <http://dx.doi.org/10.4084/MJHID.2018.004>

National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in Oncology: Waldenstrom's macroglobulinemia/Lymphoplasmacytic lymphoma. V.1.2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/waldenstroms.pdf](http://www.nccn.org/professionals/physician_gls/pdf/waldenstroms.pdf) on June 21, 2018.

Rajkumar SV, Dispenzieri A. Chapter 104: Multiple myeloma and related disorders. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014.

See all references for Waldenstrom Macroglobulinemia  
([www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html](http://www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html))

Last Medical Review: July 19, 2018 Last Revised: July 19, 2018

---

## Radiation Therapy for Waldenstrom Macroglobulinemia

Radiation therapy uses high-energy rays to kill cancer cells. This type of treatment is not used often to treat Waldenstrom macroglobulinemia (WM). Rarely, it is used to shrink an enlarged spleen or lymph nodes if they are causing symptoms.

The type of radiation therapy used to treat WM is called **external beam radiation**. The treatment is much like getting an x-ray, but the radiation is much stronger. The procedure itself is painless. Before the treatments start, the radiation team takes careful measurements to determine the correct angles for aiming the radiation beams and the proper dose of radiation. Each treatment lasts only a few minutes, although the setup time — getting you into place for treatment — usually takes longer. Most often, radiation treatments are given 5 days a week for a few weeks.

### Possible side effects

Immediate side effects of radiation therapy can include sunburn-like skin problems, fatigue, and low blood cell counts. Other side effects depend on the area being treated. Radiation of the abdomen may cause [nausea, vomiting](#)<sup>1</sup>, or [diarrhea](#)<sup>2</sup>. Radiation to the head and neck area can lead to [mouth sores](#)<sup>3</sup> and [trouble swallowing](#)<sup>4</sup>. Often these effects go away a short while after treatment is finished.

A rare long-term side effect of radiation is a [new cancer developing](#)<sup>5</sup> in the treated area.

To learn more, visit [Radiation Therapy](#)<sup>6</sup>.

## Hyperlinks

1. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/nausea-and-vomiting.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/nausea-and-vomiting.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/stool-or-urine-changes/diarrhea.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/stool-or-urine-changes/diarrhea.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/mouth-problems/mouth-sores.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/mouth-problems/mouth-sores.html)
4. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/eating-problems/swallowing-problems.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/eating-problems/swallowing-problems.html)
5. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/second-cancers-in-adults.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/second-cancers-in-adults.html)
6. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation.html)

## References

Buske C, Leblond V, Dimopoulos M, et al. Waldenstrom's macroglobulinaemia: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol*. 2013;24 Suppl 6:vi155–159.

Gertz MA. Waldenström macroglobulinemia: 2017 update on diagnosis, risk stratification, and management. *Am J Hematol*. 2017;92:209-217.

Mazzucchelli M., Frustaci A.M., Deodato M., Cairoli R., Tedeschi A. Waldenstrom's macroglobulinemia: an update. *Mediterr J Hematol Infect Dis* 2018, 10(1): e2018004, DOI: <http://dx.doi.org/10.4084/MJHID.2018.004>

National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in Oncology: Waldenstrom's macroglobulinemia/Lymphoplasmacytic lymphoma. V.1.2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/waldenstroms.pdf](http://www.nccn.org/professionals/physician_gls/pdf/waldenstroms.pdf) on June 21, 2018.

Rajkumar SV, Dispenzieri A. Chapter 104: Multiple myeloma and related disorders. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014.

See all references for Waldenstrom Macroglobulinemia ([www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html](http://www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html))

Last Medical Review: July 19, 2018 Last Revised: July 19, 2018

## When to Treat People With Waldenstrom Macroglobulinemia

Waldenstrom macroglobulinemia (WM) is generally not considered to be curable, but it is treatable. Many different medicines can help keep WM under control, often for long periods of time.

Not everyone with WM needs treatment right away. In fact, some people are diagnosed with WM before they even have symptoms from it. Most experts recommend that people with WM should not usually be treated until the disease is causing problems. This lets people avoid the side effects of chemotherapy (chemo), targeted therapy, or immunotherapy drugs until they really need these medicines. In fact, studies suggest that patients who delay treatment until their WM is causing problems do not live any less time than those who start treatment as soon as they are diagnosed.

Doctors agree that [hyperviscosity syndrome](#) is a reason to treat with plasmapheresis right away, because it can be life threatening. Other reasons to start treatment include problems from amyloidosis or cryoglobulins, as well as anemia (too few red blood cells), kidney or heart problems, nerve damage, or any severe symptom from the WM.

Once a decision has been made to start treatment, there are several options, depending on the patient's age, general health, and symptoms. Treatment is also based on whether or not the patient might have a [stem cell transplant](#) in the future.

The drugs used to treat WM can be given in a variety of combinations and schedules depending on the situation. Some doctors like to combine drugs (often some type of chemotherapy plus rituximab), while others prefer to start with a single drug. The patient's age, overall health, and symptoms can also affect which treatments are recommended.

In general, rituximab is not usually given when the IgM level is very high because it can make the IgM level temporarily go up even higher. Plasmapheresis may be used first to lower the IgM level before starting rituximab. Another option is to give rituximab along with ibrutinib because the combination can rapidly reduce the level of IgM.

If a stem cell transplant might be used later on, many experts recommend not giving certain chemo drugs (chlorambucil, bendamustine, cladribine, or fludarabine) because they might affect the stem cells in the body.

Some of the drugs and combinations that might be used as the first treatment for WM include:

- Ibrutinib, with or without rituximab
- Bendamustine, with or without rituximab
- Bortezomib, with or without dexamethasone and/or rituximab
- Chlorambucil
- Cladribine, with or without rituximab
- Cyclophosphamide, doxorubicin, vincristine, prednisone, and rituximab (CHOP-R)
- Cyclophosphamide, prednisone, and rituximab (CPR)
- Fludarabine, with or without rituximab
- Fludarabine, cyclophosphamide, and rituximab (FCR)
- Rituximab
- Rituximab, cyclophosphamide, and dexamethasone (RCD)
- Thalidomide, with or without rituximab

Other drugs and drug combinations can also be used. Talk to your doctor about which regimen might be best for you based on your situation.

During treatment, you'll have regular visits with your doctor, who will ask you about your symptoms, do physical exams, and test your blood to see how well the treatment is working. In most people with WM, the disease will respond to treatment (IgM levels will go down and symptoms will get better) within a few months, although this may take longer in people getting only rituximab. If the WM responds, options include close monitoring for signs of disease progression or giving rituximab on a regular schedule to help keep the disease in check.

## **If treatment doesn't work or if the disease comes back after treatment**

No single treatment for WM works for all patients. If the first drug or set of drugs doesn't work, other drugs may be helpful.

Most people with WM will require treatment with different drugs at some point. Often, a certain drug or combination of drugs will work at first, but over time it might stop working. Or a person might stop treatment if the WM is under control, only to have it [come back](#)<sup>1</sup> some time later. If the WM remained under control for at least a year after

the first treatment, then giving the same drug(s) again can often help bring the cancer back under control.

If the cancer comes back sooner, or if the initial treatment was not effective, then switching to another drug or drug combination is likely to be a better option. Many of the same drugs and combinations listed above as first-line treatments might be helpful here. Other drugs that might also be tried include alemtuzumab (Campath), ofatumumab (Arzerra), or everolimus (Afinitor). High-dose chemotherapy with stem cell transplant might also be an option for some patients.

If chemotherapy or other drugs are no longer slowing the growth of the WM, some patients can still get relief from symptoms by getting plasmapheresis at regular intervals to lower the levels of the abnormal IgM protein in their blood.

Sometimes WM can turn into an aggressive lymphoma. When this happens, the cancer grows much more quickly and causes symptoms that can soon become life threatening. These lymphomas are usually treated with a combination of several chemo drugs like those used for patients who are first diagnosed with an aggressive non-Hodgkin lymphoma (see the treatment section of [Non-Hodgkin Lymphoma<sup>2</sup>](#)). If combination chemo is not successful, high-dose chemo with a stem cell transplant may be an option.

## Hyperlinks

1. [www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html)
2. [www.cancer.org/cancer/non-hodgkin-lymphoma.html](http://www.cancer.org/cancer/non-hodgkin-lymphoma.html)

## References

Buske C, Leblond V, Dimopoulos M, et al. Waldenstrom's macroglobulinaemia: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol*. 2013;24 Suppl 6:vi155–159.

Dimopoulos MA et al. Phase 3 Trial of Ibrutinib plus Rituximab in Waldenström's Macroglobulinemia. *N Engl J Med*. 2018; 378:2399-2410.

Gertz MA. Waldenström macroglobulinemia: 2017 update on diagnosis, risk stratification, and management. *Am J Hematol*. 2017;92:209-217.

Mazzucchelli M., Frustaci A.M., Deodato M., Cairoli R., Tedeschi A. Waldenstrom's

macroglobulinemia: an update. *Mediterr J Hematol Infect Dis* 2018, 10(1): e2018004, DOI: <http://dx.doi.org/10.4084/MJHID.2018.004>

National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in Oncology: Waldenstrom's macroglobulinemia/Lymphoplasmacytic lymphoma. V.1.2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/waldenstroms.pdf](http://www.nccn.org/professionals/physician_gls/pdf/waldenstroms.pdf) on June 21, 2018.

Rajkumar SV, Dispenzieri A. Chapter 104: Multiple myeloma and related disorders. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014.

See all references for Waldenstrom Macroglobulinemia  
([www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html](http://www.cancer.org/cancer/waldenstrom-macroglobulinemia/references.html))

Last Medical Review: July 19, 2018 Last Revised: July 19, 2018

### Written by

The American Cancer Society medical and editorial content team  
([www.cancer.org/cancer/acs-medical-content-and-news-staff.html](http://www.cancer.org/cancer/acs-medical-content-and-news-staff.html))

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy ([www.cancer.org/about-us/policies/content-usage.html](http://www.cancer.org/about-us/policies/content-usage.html)).

**cancer.org | 1.800.227.2345**