Improving Lives Finding the Cure®

Understanding EMPLICITI®
(elotuzumab)

International Myeloma Foundation®

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Improving Lives Finding the Cure®
About the International Myeloma Foundation

Founded in 1990, the International Myeloma Foundation (IMF) is the oldest and largest myeloma-specific charity in the world. With more than 350,000 members in 140 countries, the IMF serves myeloma patients, family members, and the medical community. The IMF provides a wide range of programs in the areas of Research, Education, Support, and Advocacy:

**RESEARCH** The IMF is the leader in globally collaborative myeloma research. The IMF supports lab-based research and has awarded over 100 grants to top junior and senior researchers since 1995. In addition, the IMF brings together the world’s leading experts in the most successful and unique way through the International Myeloma Working Group (IMWG), which is publishing in prestigious medical journals, charting the course to a cure, mentoring the next generation of innovative investigators, and improving lives through better care.

**EDUCATION** The IMF’s educational Patient & Family Seminars, Medical Center Workshops, and Regional Community Workshops are held around the world. These meetings provide up-to-date information presented by leading myeloma specialists and researchers directly to myeloma patients and their families. Our library of more than 100 publications, for patients and caregivers as well as for healthcare professionals, is updated annually and available free of charge. Publications are available in more than 20 languages.

**SUPPORT** Our toll-free InfoLine at 800-452-CURE (2873) is staffed by coordinators who answer questions and provide support and information via phone and email to thousands of families each year. The IMF sustains a network of more than 150 support groups and offers training for the hundreds of dedicated patients, caregivers, and nurses who volunteer to lead these groups in their communities.

**ADVOCACY** The IMF Advocacy program trains and supports concerned individuals to advocate on health issues that affect the myeloma community. Working both at the state and federal level, the IMF leads two coalitions to advocate for parity in insurance coverage. Thousands of IMF-trained advocates make a positive impact each year on issues critical to the myeloma community.

Learn more about the way the IMF is helping to improve the quality of life of myeloma patients while working toward prevention and a cure. Contact us at **800-452-CURE (2873)** or **818-487-7455**, or visit myeloma.org.

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What you will learn from this booklet

The IMF’s Understanding series of booklets is designed to acquaint you with treatments and supportive care measures for multiple myeloma (which we refer to simply as “myeloma”). Words in bold type are explained in the “Terms and definitions” section at the end of this booklet, as well as in a more complete compendium of myeloma-related vocabulary, the IMF’s Glossary of Myeloma Terms and Definitions, located at glossary.myeloma.org.

This booklet discusses the new drug Empliciti® (known also by its generic name, elotuzumab): the way it works, the results of clinical trials with Empliciti, how and when Empliciti is administered, the possible side effects of Empliciti, and how to manage those side effects (also known as “adverse events”).

Before reading this booklet, it may be helpful to read another IMF publication entitled Understanding the Immune System in Myeloma, which will provide you with some background information on the types and functions of immune system cells, how they work together to protect us, the impact of myeloma on the immune system, and the way Empliciti enlists immune system cells to attack myeloma.

What is Empliciti?

Empliciti is the first immunostimulatory monoclonal antibody approved for the treatment of myeloma. It was approved by the United States Food and Drug Administration (FDA) in combination with Revlimid® (lenalidomide) and the steroid dexamethasone, because clinical trials demonstrated that the combination is more effective than Revlimid plus dexamethasone without Empliciti. This antibody is made in a laboratory rather than inside the human body, and it has been designed to target a particular protein called “SLAMF7” that is found on the surface of most myeloma cells. SLAMF7 stands for “Signaling Lymphocytic Activation Molecule.” SLAMF7 also appears on the surface of a subset of white blood cells (WBC, the cells that make up our immune system) called natural killer (NK) cells. NK cells are immune system cells that patrol for, and kill, tumor cells.

How does Empliciti work?

Both NK cells and myeloma cells have receptors for the SLAMF7 protein. Empliciti attaches to the SLAMF7 receptor on NK cells, and stimulates the NK cells to attach to and attack myeloma cells via the SLAMF7 surface receptors on myeloma cells (see Figure 1). By attaching directly to myeloma cells, Empliciti “flags” them for destruction by the NK cells. Empliciti thus works via a two-pronged approach:
- It provides a docking site for NK cells on myeloma cells.
- It recruits NK cells to attach to that dock and directly attack the myeloma cells from the outside in.

Because Empliciti stimulates these immune system cells to attack myeloma cells, and because many myeloma cells possess SLAMF7 receptors, Empliciti is effective in a large percentage of myeloma patients. As with any new drug, the possible side effects of Empliciti need to be considered as we incorporate it into our armamentarium of treatments for multiple myeloma.

Figure 1. Using NK (natural killer) cells to attack myeloma with Empliciti (elotuzumab, anti-SLAMF7)

Figure 2. Immune system cells that play a role in myeloma
cells, it not only helps to cause myeloma cell death, it also appears to stimulate an ongoing immune response against myeloma.

What were the results with Empliciti in clinical trials?

The randomized, phase III ELOQUENT-2 clinical trial for patients with relapsed and/or refractory myeloma compared the “control group” of patients receiving Revlimid + low-dose dexamethasone to the “experimental group” of patients receiving Empliciti + Revlimid + low-dose dexamethasone. The data from this clinical trial were submitted to the FDA for approval of Empliciti in combination with Revlimid + low-dose dexamethasone. For more information about Revlimid, see the IMF publication Understanding REVLIMID® (lenalidomide). For more information about dexamethasone, see the IMF publication Understanding Dexamethasone and Other Steroids.

In the ELOQUENT-2 clinical trial, 646 patients were enrolled at 224 study sites across 21 countries. Enrolled patients were randomly assigned: 321 patients to the Empliciti group and 325 to the control group. All patients had received from 1 to 3 prior therapies and were able to respond to Revlimid. Nearly 1/3 of the patients had high-risk myeloma, and more than 1/3 were refractory to their last therapy. Patients were treated until their myeloma progressed or until they were unable to tolerate the therapy.

In the ELOQUENT-2 clinical trial, the addition of Empliciti to Revlimid + dexamethasone resulted in a 30% reduction in the risk of disease progression. There was a median remission duration, or progression-free survival (PFS), of an additional 4.5 months with Empliciti + Revlimid + dexamethasone (19.4 months) versus Revlimid + dexamethasone alone (14.9 months). PFS was reported at 24.5 months, with 41% of patients who had received Empliciti + Revlimid + dexamethasone still in remission at that point compared to 27% of patients in the control group. The overall response rate (ORR) in the Empliciti group was 79%, versus 66% in the control group. At 24.5 months after the start of the clinical trial, 35% of the patients in the Empliciti arm were still on the study, as compared to 21% of the patients who were in the control arm.

Important note: Over time, the difference between the PFS of patients treated with Empliciti + Revlimid + dexamethasone and those treated with Revlimid + dexamethasone became greater. This increasing duration of response among patients who received Empliciti suggests that the addition of the monoclonal antibody to Revlimid + dexamethasone boosts patients’ ongoing immune response against myeloma.

Just as Empliciti improves patients’ response to Revlimid + dexamethasone by enlisting the help of immune system cells, the reverse is true as well: Revlimid improves patients’ response to Empliciti. The results of earlier myeloma clinical trials with Empliciti alone, as compared to those that included Revlimid + dexamethasone, demonstrated that Revlimid is a necessary part of the therapy. Without the immunomodulatory drug (Revlimid), Empliciti was only minimally effective against myeloma. Revlimid has its own effect on the NK cells, enabling them to kill myeloma cells more effectively. Revlimid also triggers chemical messengers called cytokines that both activate NK cells and shut down another cytokine called Interleukin-6 (IL-6), a growth factor for myeloma cells.

The ELOQUENT-2 clinical trial demonstrated that the combination of a monoclonal antibody to SLAMF7 (Empliciti), an immunomodulatory drug (Revlimid), and an anti-inflammatory agent (dexamethasone), itself a modulator of immune activity, is an effective treatment for relapsed/refractory myeloma. In the ELOQUENT-2 clinical trial, the benefit for progression-free survival was consistent even among elderly and high-risk patients. Another benefit was that the addition of Empliciti to Revlimid + dexamethasone did not increase the incidence of negative side effects when compared to Revlimid + dexamethasone alone.

This is a completely new treatment approach in myeloma. Instead of directly attacking myeloma cells, Empliciti enlists and enables immune system cells to attack myeloma cells. It is still too soon to track overall survival (OS) because the majority of the patients in the clinical trial are still alive. However, the data demonstrate a higher overall response rate and a clear PFS advantage with the addition of Empliciti to Revlimid + dexamethasone. Based on these data, the FDA approved Empliciti in combination with Revlimid + dexamethasone on November 30, 2015.

What is the indication for use of Empliciti?

In the United States and in the European Union, Empliciti is approved in combination with Revlimid + dexamethasone for the treatment of myeloma patients who have received 1 to 3 prior therapies.

How is Empliciti given?

Empliciti is given as an intravenous (IV, or into the vein) infusion. Medication is given before the infusion to help prevent an infusion reaction.
What are the possible side effects of Empliciti + Revlimid + dexamethasone, and how are they managed?

Side effects were nearly equal in the experimental and control arms of the ELOQUENT-2 clinical trial, demonstrating that Empliciti adds little or no toxicity over that of Revlimid + dexamethasone. Of the common side effects that occurred in 30% or more of the patients who participated in the ELOQUENT-2 clinical trial, adverse events affecting the blood cells were most prevalent. Almost all the patients in both the Empliciti + Revlimid + dexamethasone experimental group and the Revlimid + dexamethasone control group had low counts of white cells known as lymphocytes (99% of the patients in the experimental group and 98% in the control group), lymphocytopenia or low lymphocyte counts). 96% in the experimental arm and 95% in the control arm had anemia (low red blood cell count). Neutropenia (low count of white blood cells called neutrophils) and thrombocytopenia (low count of platelets or thrombocytes that enable blood to clot) were also frequent. The most serious blood cell-related side effects – those that led to hospitalization and/or were life-threatening – were low white cell counts, which occurred similarly in both the experimental and control arms of the clinical trial.

Among side effects other than low blood cell counts, infections were most common, pneumonia in particular. Approximately 25% of the patients in both arms of the study had infections of grade 3 or grade 4, meaning that they were ill enough to be hospitalized, and that the most severe cases (grade 4) were life-threatening.

Fatigue and diarrhea were the next most common adverse events. Both occurred in 47% of patients, although fewer than 9% of the cases of fatigue and 5% of the cases of diarrhea were serious enough to prevent the patients from performing the activities of daily living. The next most common adverse events were fever (which occurred in 37% of patients), constipation (36%), cough (31%), and muscle spasms (30%).

Infusion Reactions

Monoclonal antibodies entered the cancer-fighting armamentarium over a decade ago, but they are new to myeloma. Empliciti, like other monoclonal antibodies, is well tolerated and has no significant side effects that overlap with Revlimid + dexamethasone. Like many other monoclonal antibodies, Empliciti may, however, cause infusion reactions, giving rise to a range of responses that may be caused by the release of cytokines. Infusion reactions, which can happen during the infusion or within 24 hours after an infusion of Empliciti, occurred in 10% of the patients who received Empliciti in the ELOQUENT-2 clinical trial, although 70% of those infusion reactions occurred only with the first dose. Infusion reactions with Empliciti, which are likely to be cytokine-mediated, subside with each subsequent dose. The most common infusion reactions were fever, chills, and elevated blood pressure (hypertension). There were no infusion reactions that were serious enough to require hospitalization, and only 2 out of 321 patients dropped out of the ELOQUENT-2 clinical trial because of an infusion reaction.

Prevention and treatment of infusion reactions

Tell your healthcare provider to get medical help right away if you have any of these symptoms after your infusion of Empliciti:
- fever
- chills
- rash
- trouble breathing
- dizziness
- light-headedness

Premedications are given with each dose of Empliciti to reduce the risk of infusion reactions. Reactions can also be managed by pausing the infusion and/or restarting the infusion at a slower rate.

Lymphocytopenia and Neutropenia

Patients may experience conditions called lymphocytopenia and neutropenia, which reflect a lowered level of lymphocytes and neutrophils. White blood cells help to fight infection. Too few white blood cells can lead to infections.
in the body, which may cause shortness of breath and feelings of exhaustion. Anemia is not an immediate effect of Empliciti + Revlimid + dexamethasone, but one that may appear with duration of treatment.

**Prevention and treatment of anemia**
Your healthcare providers will determine which treatment regimen for anemia is best suited to your needs and safest for you. The following are options for treatment of anemia:
- Adjusting medications
- Blood transfusions
- Erythropoietic (red blood cell-making) agents

**Thrombocytopenia**
Thrombocytopenia is a lowered level of platelets in the blood. Platelets help blood to clot; fewer platelets can lead to bruising, bleeding, and slower healing.

**Prevention and treatment of thrombocytopenia**
You should inform your physician if you experience excessive bruising or bleeding. Management may include platelet transfusions or a thrombocyte growth-stimulating agent, at the discretion of your physician.

**Fatigue**
Fatigue is commonly associated with cancer and with cancer therapy. Caution is advised if you are operating machinery, including automobiles. For more detailed information, please see the IMF publication *Understanding Fatigue*.

**Prevention and treatment of fatigue**
Management of fatigue may include treatment, as determined by your physician. The effects of fatigue may be minimized by maintaining:
- A moderate level of activity
- A healthy diet and proper fluid intake
- A consistent sleeping schedule with enough rest
- Regularly scheduled visits with your doctor or healthcare provider to discuss fatigue issues
- A careful review of the side effects of all the other supplements and medications you are taking, in addition to Empliciti + Revlimid + dexamethasone, to ensure that they are not contributing to your fatigue.

**Diarrhea**
Diarrhea may occur while taking Empliciti + Revlimid + dexamethasone. Dizziness, light-headedness, or fainting may occur due to dehydration caused by either excessive or persistent diarrhea.

**Prevention and treatment of diarrhea**
Precautions should be taken to prevent dehydration caused by either excessive or persistent diarrhea. You should maintain a proper level of hydration by drinking a sufficient amount of water and seek medical advice if you experience dizziness, light-headedness, or fainting. Your physician may administer antidiarrheal medication or IV hydration, as required.

**Fever**
Fever is defined as an oral temperature greater than 38°C or 100.4°F in a 24-hour period, or one temperature greater than 38.5°C or 101.3°F. When the white cell count is low, the body’s normal defenses against infections are down, and fever needs to be further evaluated immediately. In clinical trials with Empliciti, fevers likely arose from two causes: as a reaction to medication (from the release of cytokines, an immune response that causes flu-like symptoms) and/or from a bacterial or viral infection (from a low white cell count resulting in impaired immune response).

**Prevention and treatment of fever**
You can minimize the effects of fever in the following ways:
- Notify your healthcare team immediately if you have a fever greater than 38.5°C or 101.3°F.
- If your doctor’s office is closed and you are not able to reach a covering physician, go to an urgent care facility or emergency room to have the fever worked up.
- Check your temperature twice a day if you feel warm.
- To avoid dehydration, drink a lot of non-alcoholic and non-caffeinated liquids.
- Take medications to control the fever as indicated.
Your treating physician may also do the following to control fever and treat its cause:

- Tell you to use over-the-counter (OTC) medications that you can buy without a prescription, such as acetaminophen, to treat fever related to flu-like syndrome. Do not take more than the recommended amount of acetaminophen in a 24-hour time frame. There are other drugs used to reduce fever that may be an option, but you should not take any medications without first consulting a doctor familiar with your medical history.

- If you have a fever as a result of an infection, the doctor will prescribe antibiotics, or you may need to receive intravenous antibiotics in the hospital. You may also be given a colony-stimulating factor (CSF), a drug that helps to boost the white cell count.

**Constipation**

Prevention is the key to managing constipation, which is defined as having fewer than three bowel movements a week. Chronic constipation is defined as infrequent bowel movements or difficult passage of stools that persists for several weeks or longer.

**Prevention and treatment of constipation**

These strategies may help alleviate constipation:

- Drink at least eight 8-ounce glasses of fluid daily.
- Add plenty of dietary fiber every morning, such as prune juice, apple juice, or bran.
- Get some exercise daily, even if it’s just walking. Moving your body increases peristalsis, the rhythmic contractions that move food through the digestive system.
- Report the problem to a member of your healthcare team, who may recommend a stool softener or laxative.

**Infections**

Infections as mild as a cold (an upper respiratory tract infection) or as severe as pneumonia can occur in people who receive Empliciti + Revlimid + dexamethasone. Cough, runny nose, and sore throat are all common side effects experienced by patients taking Empliciti + Revlimid + dexamethasone, and may be signs of an upper respiratory tract infection. The signs and symptoms of pneumonia vary depending on what is causing the infection. Mild signs and symptoms are similar to those of a cold or flu, but they last longer.

Tell your healthcare provider immediately if you have any signs and symptoms of an infection, including:

- Fever
- Flu-like symptoms (body aches, sweating, chills, fatigue)
- Cough (which may produce phlegm)
- Shortness of breath
- Chest pain when you breathe or cough
- Burning with urination
- A painful skin rash
- Nausea, vomiting, or diarrhea

**Prevention and treatment of infections**

You should report your symptoms to your healthcare team, who will determine how the symptoms should be managed, and if you need to receive an antibiotic or other medications. If your doctor or another doctor covering the practice is not available to diagnose or rule out pneumonia, which can be a severe infection, you should go to an urgent care or emergency facility.

**Muscle spasms**

Muscle spasms occur when a skeletal muscle contracts forcefully and involuntarily and does not relax. Leg muscles, especially the thighs, hamstrings, and calves, are most likely to contract, but any skeletal muscle in the body can cramp. Dehydration, electrolyte imbalance, and physical deconditioning may all cause muscle spasms, but they may also be related to neuropathy caused by treatment or arising from the myeloma itself.

**Prevention and treatment of muscle spasms**

If you have frequent, painful muscle spasms and cramps that interfere with your sleep or your ability to perform the activities of daily living, you should report the problem to your healthcare provider. You may need a referral to a neurologist to help determine the origin of the problem, and if it is neurologic, to treat the neuropathy.

Some non-neurologic causes of muscle spasms can be prevented by drinking adequate amounts of non-alcoholic and non-caffeinated liquids and getting some light daily exercise. If any of your electrolytes (e.g., sodium, potassium, magnesium, calcium, chloride, phosphate, bicarbonate) are low, your doctor may need to oversee an increase or decrease in your fluid intake and/or prescribe oral or intravenous mineral supplements.

**Decreased appetite**

There are many causes for loss of appetite during treatment, including side effects of treatment such as diarrhea and constipation. Lack of exercise, anxiety, depression, and pain can also be at the root of
the problem. Good communication with members of your healthcare team will help them understand how you’re feeling physically and mentally, and may help determine the source of your appetite loss.

Prevention and treatment of decreased appetite

- Managing your gastrointestinal health and controlling diarrhea or constipation while on Empliciti + Revlimid + dexamethasone is an important step in maintaining your appetite.
- If you are losing weight, your doctor or nurse may refer you to a nutritionist or suggest a nutritional supplement to provide more calories.
- If appropriate, your doctor may also refer you to a mental health counselor to help you with depression and/or anxiety.

In closing

While a diagnosis of cancer is something you cannot control, gaining knowledge that will improve your interaction with your doctors and nurses is something you can control, and it will have a significant impact on how well you do throughout the disease course.

This booklet is not meant to replace the advice of your doctors and nurses, who are best able to answer questions about your specific healthcare management plan. The IMF intends only to provide you with information that will guide you in discussions with your healthcare team. To help ensure effective treatment with good quality of life, you must play an active role in your own medical care.

We encourage you to visit myeloma.org for up-to-date information about myeloma, and to contact the IMF InfoLine with your myeloma-related questions and concerns. The IMF InfoLine consistently provides callers with the best information about myeloma in a caring and compassionate manner. IMF InfoLine specialists can be reached at InfoLine@myeloma.org, or 800-452-CURE (2873) or 818-487-7455.

Terms and definitions

Anemia: A decrease in hemoglobin contained in red blood cells that carry oxygen to the body’s tissues and organs. Anemia is usually defined as hemoglobin below 10 g/dL, with over 13–14 g/dL considered normal, and/or a decrease of ≥ 2 g/dL from the normal level for an individual.

Antibody: A protein produced by white blood cells called plasma cells that helps fight infection and disease.

Clinical trial: A research study of new treatment that involves patients. Each study is designed to find better ways to prevent, detect, diagnose, or treat cancer and to answer scientific questions.

- **Control group** – The arm of a randomized clinical trial that gets the standard treatment or placebo (no treatment).
- **Experimental group** – The arm of a randomized trial that gets the new treatment.
- **Randomized clinical trial** – A research study in which subjects are randomly assigned to receive a particular treatment or not.
- **Arm** – One of the treatment groups of a randomized trial. The majority of randomized trials have two, but some have more.
- **End point** – The goal of the trial; what a clinical trial is trying to measure or find out. Typical end points include measurements of toxicity, response rate, and survival.
- **Double blind** – Aspect of a randomized trial in which neither the participant nor the investigator knows the arm of the trial to which the patient is assigned. The purpose is to eliminate any bias in the reporting of results.
- **Phase I trial** – A trial designed to determine the maximum-tolerated dose (MTD) of a new drug or a new combination of drugs. It is usually the first human testing of a new treatment, although in phase I trials of combination therapies, the individual elements may already have been well tested. Patients in phase I trials generally have advanced cancer that is refractory to all standard treatment. In a typical phase I trial, successive groups (“cohorts”) of 3 to 6 patients are given the treatment. All patients in a cohort get the same dose. The first cohort typically gets a very low dose, and the dose is raised in each subsequent cohort until a set number of patients experience dose-limiting toxicity (DLT). The dose level used for the previous cohort is then taken to be the MTD. This dose is then used in a phase II trial.
- **Phase II trial** – A trial designed to determine the response rate of a new therapy that has already been tested in phase I trials. Typically, 14 to 50 patients with one type of cancer are treated to see how many have a response. Patients are usually required to have advanced cancer that is refractory to any standard treatment, and in addition, they must have measurable disease. If results from a phase II trial are promising enough, the treatment may then be tested in a phase III trial. If the results are obviously much better than the standard treatment, then it may not be necessary to do a phase III trial, and the treatment may become standard-based on phase II trial results.
- **Phase III trial** – A trial designed to compare two or more treatments for a given type and stage of cancer. The end point of a phase III trial is usually survival or disease-free survival. Phase III trials are usually randomized, so patients don’t choose which treatment they receive. A typical phase III trial has 50 to thousands of patients. Some phase III trials
A cancer arising
The per
According to the
–
Drugs that stimulate
See "Myeloma that is
Progressive
Pro
An artificially
The complex group of
disease
Disease progression:
normally released in response to infection.
Reduced levels of cytokines, tumors, and other foreign substances.
Cytokines: Proteins secreted by cells which can stimulate or inhibit growth/ activity in other cells. Cytokines are produced locally (i.e., in the bone marrow) and circulate in the bloodstream. They are normally released in response to infection.
Disease progression: See “Progressive disease.”
Electrolytes: Minerals in your blood and other body fluids that carry an electrical charge and are essential for life. Electrolytes include sodium, potassium, calcium, magnesium, chloride, and phosphorus. They affect the amount of water in the body, the acidity of the blood (pH), nerve and muscle function (including the heart), and other important processes.
Growth factors: Drugs that stimulate blood stem cells both to grow and to be released into the bloodstream.
High-risk myeloma: According to the International Myeloma Group consensus on risk stratification in myeloma, markers have been identified that can be applied to more than 90% of all myeloma patients to define high-risk myeloma: ISS stage II/III and the presence of either the t(4;14) or 17p13 genetic mutations by FISH testing.
Immune system: The complex group of organs and cells that produces antibodies, cellular responses to defend the body against foreign substances such as bacteria, viruses, toxins, and cancers.
Immunomodulatory drug: An agent that affects, enhances, or suppresses the immune system. Sometimes called an IMiD® compound.
Infusion reaction: An allergic or cytokine-related response to an intravenously administered cancer treatment.
Lymphocytes: B-cells, T-cells, and natural killer (NK) cells, which together constitute 30% of white blood cells. B-lymphocytes and T-lymphocytes are responsible for the adaptive immune response, which enables immune system cells to attach to specific antigens on the cell surfaces of infectious organisms, tumors, and other foreign substances.
Lymphocytopenia: Low levels of B-cells, T-cells, and natural killer (NK) cells, which together constitute 30% of white blood cells. B-lymphocytes and T-lymphocytes are responsible for the adaptive immune response, which enables immune system cells to attach to specific antigens on the cell surfaces of infectious organisms, tumors, and other foreign substances.
Monoclonal antibody: An artificially manufactured antibody (that is, made in a lab rather than in the human body) that is specifically designed to find and bind to cancer cells and/or immune system cells for diagnostic or treatment purposes. Monoclonal antibodies can be used alone, or they can be used to deliver drugs, toxins, or radioactive material directly to tumor cells.
Multiple myeloma: A cancer arising from the plasma cells in the bone marrow. The cancerous plasma cells are called myeloma cells.
Natural killer (NK) cell: A lymphocyte (type of white blood cell) that is a component of the innate immune system. NK cells are responsible for tumor surveillance and are able to induce strong responses against tumors through the release of cytokines.
Neutropenia: A reduced level of neutrophils.
Overall response rate (ORR): The percentage of patients in a clinical trial whose monoclonal protein decreased by at least 50% in response to treatment.
Overall survival (OS): For a group of individuals suffering from a cancer, this term denotes the chances of staying alive. It denotes the median number of individuals in the group who are likely to be alive after a particular duration of time. At a basic level, OS is representative of cure rates. OS is often used as a measure of treatment efficacy in clinical trials.
Progression-free survival (PFS): The improved survival of a patient that can be directly attributed to the treatment given for the myeloma. The time period during which the patient survives, and the myeloma does not regrow or relapse. See “Progressive disease.”
Progressive disease: Myeloma that is becoming worse or relapsing, as documented by tests. Defined as an increase of ≥25% from lowest confirmed response value in the myeloma protein level and/or new evidence of disease.
RFS: Refractory: Disease that is no longer responsive to standard treatments. Patients with refractory myeloma have had progressive disease either during treatment or within 60 days following treatment. Most clinical trials for advanced disease are for patients with relapsed and/or refractory myeloma.
Response or remission: Complete or partial disappearance of the signs and symptoms of cancer. Remission and response are interchangeable terms.
• Stringent complete response (sCR) – sCR is CR (as defined below) plus normal FLC ratio and absence of clonal cells in bone marrow by immunohistochemistry or immunofluorescence.

Colony-stimulating factor (CSF): Proteins that stimulate the development and growth of blood cells. Neupogen® (filgrastim), Neulasta® (pegfilgrastim), and Leukine® (sargramostim) are colony-stimulating factors that are used to mobilize stem cells from the bone marrow into the bloodstream prior to apheresis. These may also be used after the transplant to hasten blood count recovery.

Minerals in your blood and other body fluids that carry an electrical charge and are essential for life. Electrolytes include sodium, potassium, calcium, magnesium, chloride, and phosphorus. They affect the amount of water in the body, the acidity of the blood (pH), nerve and muscle function (including the heart), and other important processes.

Overall response rate (ORR): The percentage of patients in a clinical trial whose monoclonal protein decreased by at least 50% in response to treatment.

Overall survival (OS): For a group of individuals suffering from a cancer, this term denotes the chances of staying alive. It denotes the median number of individuals in the group who are likely to be alive after a particular duration of time. At a basic level, OS is representative of cure rates. OS is often used as a measure of treatment efficacy in clinical trials.

Progression-free survival (PFS): The improved survival of a patient that can be directly attributed to the treatment given for the myeloma. The time period during which the patient survives, and the myeloma does not regrow or relapse. See “Progressive disease.”

Progressive disease: Myeloma that is becoming worse or relapsing, as documented by tests. Defined as an increase of ≥25% from lowest confirmed response value in the myeloma protein level and/or new evidence of disease.

RFS: Refractory: Disease that is no longer responsive to standard treatments. Patients with refractory myeloma have had progressive disease either during treatment or within 60 days following treatment. Most clinical trials for advanced disease are for patients with relapsed and/or refractory myeloma.

Response or remission: Complete or partial disappearance of the signs and symptoms of cancer. Remission and response are interchangeable terms.

• Stringent complete response (sCR) – sCR is CR (as defined below) plus normal FLC ratio and absence of clonal cells in bone marrow by immunohistochemistry or immunofluorescence.
• **Complete response (CR)** – For myeloma, CR is negative immunofixation on serum (blood) and urine, and disappearance of any soft tissue plasmacytomas, and ≤ 5% plasma cells in bone marrow. CR is not the same as a cure.

• **Very good partial response (VGPR)** – VGPR is less than CR. VGPS is serum M-protein and urine M-protein detectable by immunofixation but not on electrophoresis, or 90% or greater reduction in serum M-protein, plus urine M-protein less than 100 mg per 24 hours.

• **Partial response (PR)** – PR is a level of response in which there is at least a 50% reduction in M-protein, and reduction in 24-hour urinary M-protein by at least 90% (or to less than 200 mg per 24 hours).

**Side effect:** Unwanted effect caused by a drug. Also known as adverse event or adverse reaction.

**Steroid:** A type of hormone. Steroids are often given to myeloma patients along with one or more anticancer drugs and typically enhance the anti-myeloma treatment benefit.

**Thrombocytopenia:** A low number of platelets in the blood. “Normal” levels vary from laboratory to laboratory. The normal level at the Mayo Clinic is 150,000–450,000. If the platelet count is less than 50,000, bleeding problems could occur. Major bleeding is usually associated with a reduction to less than 10,000.

**Tumor:** An abnormal mass of tissue that results from excessive cell division.

**White blood cells (WBC):** General term for a variety of cells responsible for fighting invading germs, infection, and allergy-causing agents. These cells begin their development in the bone marrow and then travel to other parts of the body. Specific white blood cells include neutrophils, granulocytes, lymphocytes, and monocytes.

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Notes

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One of the most daunting aspects of being diagnosed with multiple myeloma is learning about – and understanding – an unfamiliar disease that is quite complicated. From diagnosis to long-term survival, the 10 Steps to Better Care® will guide you through the myeloma journey:

1. **Know what you’re dealing with. Get the correct diagnosis.**
2. **Tests you really need.**
3. **Initial treatment options.**
4. **Supportive care and how to get it.**
5. **Transplant: Do you need one?**
6. **Response Assessment: Is treatment working?**
7. **Consolidation and/or maintenance.**
8. **Keeping Track of the Myeloma: Monitoring without mystery.**
9. **Relapse: Do you need a change in treatment?**
10. **New Trials: How to find them.**

Visit [10steps.myeloma.org](http://10steps.myeloma.org) to gain a better understanding of the disease and diagnosis, and proceed through the steps to learn the best tests, treatments, supportive care, and clinical trials currently available.

As always, the International Myeloma Foundation (IMF) urges you to discuss all medical issues thoroughly with your doctor. The IMF is here to equip you with the tools to understand and better manage your myeloma. Visit the IMF website at myeloma.org or call the IMF InfoLine at 800-452-CURE (2873) or 818-487-7455 to speak with our trained information specialists about your questions or concerns. The IMF is here to help.