

MULTIPLE MYELOMA FACT SHEET

WHAT IS MULTIPLE MYELOMA?

- In multiple myeloma, malignant plasma cells, or myeloma cells, become cancerous and multiply. As the myeloma cells grow in excess in the bone marrow, it can result in numerous health complications.¹
- Most common serious health problems will affect the bones, immune system, kidneys and blood cell count, with some of the more common symptoms including bone pain and fatigue, a sign of anemia.²
 - While in the bone marrow, myeloma cells contribute to bone destruction and can result in lytic lesions. The most common sites of lytic bone lesions include the shoulders, hips, pelvic bones, ribs and spine, which can lead to compression fractures and severe pain.¹ The potential occurrence of many lesions on a number of bones gives the disease the name “multiple myeloma.”³
- Multiple myeloma can evolve from an asymptomatic stage (smoldering myeloma) to a more active and deadly form as the number of cancerous myeloma cells in the body increases.
- Despite therapeutic advances over the last two decades, multiple myeloma remains a devastating, relapsing and incurable rare cancer.

TREATMENT PLANNING

- There is no one-size-fits-all approach to treating multiple myeloma. A treatment plan is designed for each patient individually, based on multiple factors such as age, general health, blood and bone marrow test results, symptoms, prior myeloma treatment, and a patient’s quality of life and personal preferences.⁸
 - Sustained treatment may allow patients to live longer.⁹ Attaining this goal is challenging today due to tolerability issues and logistical burdens with currently available agents. There is an unmet need for effective and sustainable therapies that are suitable for long-term use.
- Previously untreated multiple myeloma patients usually start with several cycles of primary treatment followed by tests to check the patient’s response to the treatment. Treatment may also include a stem cell transplant, based on a patient’s health status. If patients show a response, primary treatment can be continued until a patient’s best response has been achieved or given for a fixed duration of time. In case of no response, the physician will try another combination of treatments.¹⁰
- After completion of initial treatment, patients may be prescribed maintenance treatment in an attempt to delay the disease from returning or relapsing.¹⁰
- Relapse may occur one or multiple times for patients.¹¹ Considerations for treatment in relapse should include individual patient characteristics, as well as the duration and response to previous therapies, type and aggressiveness of the relapse and treatment tolerance.^{12,13}
- It is important that physicians prescribe treatment regimens according to each patient’s individual condition as well as a therapy’s prescribing information and clinical guidelines.¹¹

COMBINATION-BASED TREATMENTS

- There are multiple drug classes available for the treatment of multiple myeloma including immunomodulatory drugs (IMiDs), proteasome inhibitors, steroids, etc. These treatments are often used in combination, e.g. doublets (two drugs) or triplets (three drugs).¹⁴ If a combination regimen can be sustained for the long-term, it may allow for better patient outcomes.¹⁵
 - In the last decade, newer classes of agents such as proteasome inhibitors and IMiDs have entered the treatment landscape. These therapies have contributed to doubling survival rates for multiple myeloma patients since the 1990s when cytotoxic chemotherapy was the primary form of treatment.¹⁶
 - Proteasome inhibitors act by temporarily blocking, or inhibiting, proteasomes from breaking down proteins. This causes a buildup of proteins in the cell which can result in cell death.¹⁷
 - IMiDs have pleiotropic anti-myeloma effects.¹⁸ IMiDs modulate many of the interactions between myeloma cells and the bone marrow microenvironment, leading to decreased myeloma cell growth and survival.¹⁹ These exact mechanisms are still being researched.

¹ Multiple Myeloma Research Foundation. What Is Multiple Myeloma. Accessible on: <http://www.themmr.org/multiple-myeloma/what-is-multiple-myeloma/>. Accessed October 19, 2016.

² Multiple Myeloma Research Foundation. Multiple Myeloma Symptoms. Accessible on: <http://www.themmr.org/multiple-myeloma/symptoms/>. Accessed October 19, 2016.

³ Everyday Health. What Is Multiple Myeloma? <http://www.everydayhealth.com/multiple-myeloma/guide/>. Accessed October 19, 2016.

⁴ Mateos MV, San Miguel JF. How should we treat newly diagnosed multiple myeloma patients? Hematology Am Soc Hematol Educ Program. 2013;2013:488-495.

⁵ International Agency for Research on Cancer. Globocan 2012: Estimated Cancer Incidence, Mortality and Prevalence in 2012. Accessible on: http://globocan.iarc.fr/Pages/fact_sheets_population.aspx. Accessed October 19, 2016.

⁶ Multiple Myeloma Research Foundation. Multiple Myeloma Treatment. Accessible on: <http://www.themmr.org/multiple-myeloma/multiple-myeloma-treatment-options/>. Accessed October 19, 2016.

⁹ Palumbo A, Gay F, Cavallo F et al. Continuous Therapy Versus Fixed Duration of Therapy in Patients With Newly Diagnosed Multiple Myeloma. Journal of Clinical Oncology. 2015;60:2466.

¹⁰ National Comprehensive Cancer Network. Multiple Myeloma: NCCN Guidelines for Patients. <http://www.nccn.com>. Accessed October 19, 2016.

¹¹ Lonial S. Relapsed Multiple Myeloma. Hematology Am Soc Hematol Educ Program. 2010;2010.1:303-309.

¹² San Miguel JF. Relapse/Refractory Myeloma Patient: Potential Treatment Guidelines. Journal of Clinical Oncology. 2009;24:3683.

¹³ Mikhael JR, Dingli D, Roy V et al. Management of Newly Diagnosed Symptomatic Multiple Myeloma: Updated Mayo Stratification of Myeloma and Risk-Adapted Therapy (mSMART) Consensus Guidelines 2013. Mayo Clin Proc. 2013;88(4):360-376.

¹⁴ Multiple Myeloma Research Foundation. Multiple Myeloma Drug Therapies. Accessible on: <http://www.themmr.org/multiple-myeloma/multiple-myeloma-treatment-options/myeloma-drugs/>. Accessed October 19, 2016.

¹⁵ Lonial S, Kaufman JL. The Era of Combination Therapy in Myeloma. Journal of Clinical Oncology. 2012;30:2434-2436.

¹⁶ Kumar SK, Rajkumar SV, Dispenzieri A et al. Improved Survival in Multiple Myeloma and the Impact of Novel Therapies. Blood. 2008;111:2516-2520.

¹⁷ Prescribing Information for VELCADE. Millennium Pharmaceuticals, Inc., Cambridge, MA; 2014.

¹⁸ Quach H, Ritchie D, Stewart AK et al. Mechanism of Action of Immunomodulatory Drugs (IMiDs) in Multiple Myeloma. Leukemia. 2010;24:22-32.

¹⁹ Andhavarapu S, Roy V. Immunomodulatory Drugs in Multiple Myeloma. Expert Rev Hematol. 2013;6(1):69-82.

MULTIPLE MYELOMA'S GLOBAL IMPACT



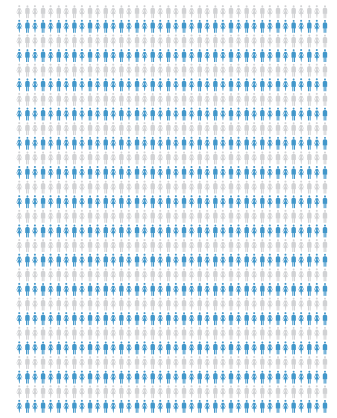
Multiple myeloma is a rare disease and represents approximately **1% of all diagnosed cancers worldwide**⁴



Approximately 114,000 new cases diagnosed globally per year⁵



Second most common type of blood cancer⁴



Nearly 230,000 people around the world are **living with multiple myeloma**⁵