

MULTIPLE MYELOMA TREATMENTS

Most treatments for multiple myeloma use more than one drug at one time. Different combinations are used at different times in a patient's life. Visit www.cancer.net/cancer-types/multiple-myeloma/latest-research for information on the latest treatment options for multiple myeloma.

TYPE OF THERAPY	GENERIC (AND BRAND) NAMES	COMMON SIDE EFFECTS
<p>CELL-BASED GENE THERAPY (CAR-T Therapy)</p> <p>Cell-based gene therapy, or chimeric antigen receptor (CAR) T cell therapy, is one way to use the body's natural defenses to fight cancer. A lab-made protein, a CAR protein, is added into the patient's own T cells. CAR-T therapy is given as IV infusion.</p>	<ul style="list-style-type: none"> • Idecabtagene vicleucel (Abecma®) by IV (through a vein) 	<ul style="list-style-type: none"> • CRS (Cytokine Release Syndrome) associated side effects: <ul style="list-style-type: none"> - Fever - Fatigue - Appetite loss - Nausea - Vomiting - Diarrhea - Head and body aches - Rashes • Infections • Musculoskeletal pain • Weakened immune system • Mental confusion • Cognitive changes • Tremors and uncoordinated balance • ICANS (Immune effector Cell-Associated Neurotoxicity Syndrome) associated side effects: <ul style="list-style-type: none"> - Nerve dysfunction - Aphasia - Seizures - Brain swelling
<p>CHEMOTHERAPY</p> <p>Proteasome inhibitors cause cell death in myeloma cells. These drugs are either given as a pill, intravenously (IV), or as a shot under the skin.</p>	<ul style="list-style-type: none"> • Melphalan (Alkeran® or Evomela®) • Cyclophosphamide (Cytoxan®) • Liposomal doxorubicin (Doxil®) 	<ul style="list-style-type: none"> • Hair loss • Nausea and vomiting • Low blood cell counts which can lead to anemia, infection, bruising, or bleeding • Neuropathy (painful nerve damage)
<p>HISTONE DEACETYLASE INHIBITOR (HDAC INHIBITOR)</p> <p>This type of drug can affect the lifecycle of myeloma cells. It is an oral medicine used for patients whose multiple myeloma comes back after treatment (relapsed) or doesn't respond to other treatments (refractory).</p>	<ul style="list-style-type: none"> • Panobinostat (Farydak®), given in combination with Velcade and dexamethasone (a steroid) 	<ul style="list-style-type: none"> • Low blood counts • Low nutrient counts • Increased possibility of infections • Diarrhea • Fatigue • Nausea

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<p>IMMUNODULATORY DRUGS (IMIDS)</p> <p>These drugs help the immune system find and attack myeloma cells. These drugs are taken as a pill (orally).</p>	<ul style="list-style-type: none"> • Lenalidomide (Revlimid[®]) • Pomalidomide (Pomalyst[®]) • Thalidomide (Thalomid[®]) at a low dose (rarely used in the U.S.) 	<ul style="list-style-type: none"> • Low blood counts • Fatigue • Muscle cramps • Risk of blood clots • Constipation • Diarrhea • Rash <p>More common for thalidomide:</p> <ul style="list-style-type: none"> • Neuropathy (painful nerve damage)
<p>MONOCLONAL ANTIBODIES</p> <p>Monoclonal Antibodies are designed to attach to proteins on cancer cells. They help your immune system find and kill myeloma cells. Monoclonal antibodies are usually given by IV.</p>	<ul style="list-style-type: none"> • Daratumumab (Darzalex[®]) targets the CD38 protein in myeloma cells • Daratumumab & hyaluronidase-fihj (Darzalex Faspro[™]) combination injection is used together with bortezomib, melphalan, lenalidomide, dexamethasone and prednisone • Elotuzumab (Empliciti[™]) targets SLAMF7, found on myeloma cells • Isatuximab-irfc (Sarclisa[®]) targets the CD38 protein in myeloma cells used in combination with carfilzomib and dexamethasone 	<ul style="list-style-type: none"> • Fatigue • Low blood counts • Constipation • Diarrhea • Infusion-related reactions <p>More common for daratumumab & hyaluronidase-fihj and Isatuximab-irfc combination injections:</p> <ul style="list-style-type: none"> • Upper respiratory tract infections • Hypertension • Nausea • Fever • Insomnia • Vomiting • Pneumonia • Back pain
<p>ANTIBODY-DRUG CONJUGATE (Immunotherapy)</p> <p>Antibody Drug Conjugates (ADC) is a type of immunotherapy that works by combining a monoclonal antibody with a chemotherapy drug. This allows to target cancer cells while limiting the damage to healthy cells.</p>	<ul style="list-style-type: none"> • Belantamab Mafodotin-blmf (Blenrep[®]) targets the B-cell maturation antigen (BCMA) 	<ul style="list-style-type: none"> • Loss of vision, blurriness, or dry eye • Excess bruising or bleeding, including nose bleeds, bleeding gums, or blood in urine or stool • High-blood sugar • Kidney problems • Fatigue • Low blood counts • Constipation • Diarrhea

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<p>PEPTIDE-DRUG CONJUGATE (Targeted Therapy)</p> <p>Peptide–drug conjugates are drugs used to block the growth of myeloma cells by blocking the action of abnormal protein that stimulates the growth of myeloma cells.</p>	<ul style="list-style-type: none"> • Melphalan flufenamide (Pepaxto[®]) used in combination with dexamethasone 	<ul style="list-style-type: none"> • Fatigue • Nausea • Diarrhea • Fever • Respiratory tract infections
<p>PROTEASOME INHIBITORS</p> <p>Proteasome Inhibitors cause cell death in myeloma cells. These drugs are either given as a pill, intravenously (IV), or as a shot under the skin.</p>	<ul style="list-style-type: none"> • Bortezomib (Velcade[®]) as an injection • Carfilzomib (Kyprolis[®]) by IV (through a vein) • Ixazomib (Ninlaro[®]), pill approved for relapsed myeloma used with Revlimid and dexamethasone (a steroid) • Selinexor (Xpovio[®]) pill approved for relapsed or refractory myeloma used with dexamethasone and bortezomib (as a shot under the skin) 	<ul style="list-style-type: none"> • Low blood counts • Nausea • Diarrhea • Constipation <p>More common for bortezomib:</p> <ul style="list-style-type: none"> • Neuropathy (painful nerve damage) <p>More common for carfilzomib:</p> <ul style="list-style-type: none"> • Cardiac effects (commonly, hypertension) <p>More common for selinexor:</p> <ul style="list-style-type: none"> • Fatigue • Pneumonia
<p>SELECTIVE INHIBITOR OF NUCLEAR EXPORT (SINE)</p> <p>This type of drug affects the lifecycle of myeloma cells and causes them to self-destruct. It is an oral medicine used for patients with relapsed or refractory myeloma.</p>	<ul style="list-style-type: none"> • Selinexor (Xpovio[®]), given in combination with dexamethasone (a steroid) 	<ul style="list-style-type: none"> • Low blood counts • Increased possibility of infections • Nausea • Diarrhea • Weight loss • Loss of appetite
<p>STEROIDS</p> <p>Steroids, in high doses, are used to trigger the death of myeloma cells. They also help decrease side effects like nausea and vomiting from chemotherapy. Some steroids are used to treat inflammation.</p>	<ul style="list-style-type: none"> • Dexamethasone (Decadron[®]) • Prednisone (Deltasone[®], Liquid Pred[®], Meticorten[®], Orasone[®]) • Methylprednisolone (Duralone[®], Medralone[®], Medrol[®], M-Prednisol[®], Solu-Medrol[®]) 	<ul style="list-style-type: none"> • Increased appetite • Sleeping problems • Fluid retention • Increased possibility of infections <p>More common for methylprednisolone:</p> <ul style="list-style-type: none"> • Irritability • Nausea • Heartburn • Muscle weakness • Impaired wound healing • Increased blood sugar levels