

Common Agents Used to Treat Multiple Myeloma: Adverse Events and Nursing Management

| Bortezomib | | |
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| Drug Profile | Common Adverse Events | Nursing Management |
| Class: Proteasome Inhibitor Indication: newly diagnosed MM Dosing: 1.3 mg/m ² twice weekly—variable schedules based on protocol | Peripheral neuropathy Overall: 39% Grade ≥ 3: 12% | Patient education/early detection Monitor at each visit Dose adjustment Grade 1 with pain or grade 2: reduce dose to 1.0 mg/m ² Grade 2 with pain or grade 3: Hold until toxicity resolves—resume at 0.7 mg/m ² Grade 4: discontinue bortezomib Safety evaluation Symptom control with pharmacologic interventions |
| | Asthenia (fatigue, malaise, weakness) Overall: 64% Grade ≥ 3: 16% | Counsel patient Avoid concurrent meds causing asthenia Balance rest and activity |
| | Myelosuppression Thrombocytopenia: Overall: 36% Grade ≥ 3: 29% Neutropenia: Overall: 17% Grade ≥ 3: 12% | Cyclical with lowest levels on day 11 of cycle Consistent pattern that is not cumulative Hold if platelets < 25,000/μL; reintroduce at 25% lower dose with recovery |
| | Diarrhea Overall: 52% Grade ≥ 3: 8% | Adequate hydration Monitor electrolytes Diet modification to avoid aggravating foods/beverages Use of antidiarrheal agents Perineal care if indicated |
| | Hypotension Overall: 13% Grade ≥ 3: 3% | Baseline evaluation of risk factors May require adjustment of antihypertensive medications Increase oral fluids, additional IV hydration may reduce severity |
| | Varicella zoster (13%-20% risk) | Prophylactic antiviral therapy is recommended for patients on continued treatment Careful monitoring for any early dermatomal pain, skin rash |

O'Connor et al. *J Clin Oncol.* 2005;23:676-684; Jagannath et al. *Br J Haematol.* 2004;127:165-172;
 Richardson et al. *N Engl J Med.* 2003;348:2609-2617.

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| Dexamethasone/Prednisone | | |
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| Class: Steroid | Common Adverse Events | Nursing Management |
| Indication: all active MM protocols Dosing: variable based on regimen | Immunosuppression | May require PCP and antiviral prophylaxis Careful monitoring for atypical infections |
| | Constitutional symptoms "let down," flushing, sweating, sleep disturbance | Taper schedule may reduce severity of "let down" Taking the medication in the morning with food may improve tolerance |
| | Weight gain, cushingoid appearance | Nutritional consult Counseling for the patient—symptoms are reversible once steroids are discontinued but may require several weeks or months |
| | Personality/mood alterations | Monitor carefully Counseling for patient and family as needed Discontinue for any signs of suicidal or homicidal ideation |
| | Dyspepsia | Take with food Use of H ₂ blocker or PPI may reduce symptoms of gastritis |
| | Myopathy | Baseline and ongoing assessment Differentiate lower-extremity weakness due to steroid myopathy vs cord compression Physical therapy consultation Strengthening exercises |
| | Hyperglycemia | Baseline and ongoing evaluation Of particular importance in patients who are diabetic or who have a strong family history of diabetes May require initiating antidiabetic medication or adjustment of existing regimen Nutritional consultation |
| | Acneiform rash | Antibacterial wash |
| | Oral candidiasis | Regular oral assessment Institute oral care regimen: mucolytic and neutralizing rinses May require antifungal agent |
| | Blurred vision, cataracts | Baseline evaluation Regular ophthalmic evaluation |

Faiman et al. *Clin J Oncol Nurs*. 2008;12(suppl):53-63.

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| Lenalidomide | | | |
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| Class: Immunomodulatory Agent Indication: newly diagnosed patients when combined with dexamethasone Dosing: 25 mg PO daily 21/28 days Dose modifications for renal impairment Variable dosing in combination regimens | Common Adverse Events Myelosuppression Neutropenia 28% (21% grade 3-4) Anemia 24% (8% grade 3-4) Thrombocytopenia 17% (10% grade 3-4) | Nursing Management Monitor CBC, diff, platelet count every 1-2 weeks for the first 12 weeks and monthly thereafter Hold drug or reduce dose based on symptomatic cytopenias Transfusions and growth factors | |
| | Renal clearance | Renal Impairment (CrCl) | Lenalidomide Dose |
| | | Moderate (30 to < 60 mL/min) | 10 mg qd |
| | | Severe (< 30 mL/min, not requiring dialysis) | 15 mg q 48 h |
| | | ESRD (< 30 mL/min, requiring dialysis) | 5 mg qd following dialysis on following day |
| | Thromboembolic events DVT—7% PE—3% | More common in combination with high-dose dexamethasone or doxorubicin Screen patients for risk factors Institute baby ASA vs full anticoagulation based on risk assessment | |
| | Rash (morbilliform) | Generally self-limiting Treatment symptomatically with antihistamines Careful evaluation for potential severe drug reactions (rare) | |
| | Gastrointestinal Constipation 30% Diarrhea 20% | Usually mild—less common than with thalidomide Adequate hydration Modification of diet Increased fluids Use of laxatives and stool softeners | |
| Usually mild intermittent cramping or diarrhea Modification of diet Use of antidiarrheal agents Rarely requires dose reduction | | | |
| Secondary malignancies | Lenalidomide maintenance <i>after HCT</i> has been associated with small number of secondary malignancies in patients treated with cyclophosphamide, etoposide, cisplatin—incidence similar to SEER data for patients age 60-85 | | |

Dimopoulos et al. *N Engl J Med.* 2007;357:2123-2132; Wang et al. *Blood.* 2008;112:4445-4451; Weber et al. *N Engl J Med.* 2007;357:2133-2142; NCCN Clinical Practice Guidelines in Oncology: Multiple Myeloma—v.1.2012.

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| Melphalan—Oral | | |
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| Class: Alkylating Agent Indication: use in non–transplant-eligible MM patients for initial therapy Dosing: variable dosing based on regimen | Common Adverse Events | Nursing Management |
| | Myelosuppression Diarrhea | Myelosuppression may be delayed with prolonged recovery Usually mild intermittent cramping or diarrhea Modification of diet Use of antidiarrheal agents Rarely requires dose reduction |

| Pegylated Liposomal Doxorubicin (PLD) | | |
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| Class: Anthracycline Indication: in combination with bortezomib for MM patients who have not previously received bortezomib and who have had at least 1 previous therapy Dosing: 30 mg/m ² —given with bortezomib on day 4 of a 21-day cycle—IV over 1 hour with initial titration of the rate (start at 1 mg/min—then increase after 15 minutes if no reaction) | Common Adverse Events | Nursing Management |
| | Most common adverse events in MM patients (> 20%): – Asthenia, fatigue, fever, anorexia, nausea, vomiting, stomatitis, diarrhea, constipation, hand-foot syndrome, rash, neutropenia, thrombocytopenia, and anemia Black box warning: – Myocardial damage, acute infusion-related reactions, myelosuppression, hepatic dysfunction | Monitoring of blood counts with each cycle—more frequently if cytopenias are present Premedicate for nausea and vomiting Institute oral care regimen Baseline evaluation for hand-foot syndrome—instruct patient to avoid aggravating factors (friction, hot liquids, tight shoes) Stomatitis is generally mild and responds to oral care regimen Careful cardiovascular screening Regular monitoring of hepatic enzymes Institute oral care regimen Avoid friction to reduce severity of hand-foot syndrome |

Orlowski et al. *J Clin Oncol.* 2007;25:3892-3901.

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| Thalidomide | | |
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| Class: Immunomodulatory Agent | Common Adverse Events | Nursing Management |
| Indication: newly diagnosed and relapsed refractory MM. Most often in combination with dex or other agents Dosing: 50-400 mg/d Variable dosing in combination regimens | Peripheral neuropathy Mild: 85% Severe: 3%-5% | Patient education/early detection Monitor at each visit Dose adjustment Grade 1: Continue with 50% dose reduction Grade 2: Hold until PN has resolved, continue with 50% dose reduction Symptom control with pharmacologic interventions |
| | Somnolence Mild: 75% Severe: 5%-10% | PM dosing Avoid concurrent meds causing drowsiness Dose adjustment |
| | Skin rash Mild: 45% | Moisturizing lotion; antihistamines; low-dose prednisone Stop thalidomide for systemic symptoms |
| | Thromboembolic complications (DVT/PE) Monotherapy: 1%-3% With dex: 10%-12% | Escalate dose gradually Anticoagulation recommended Monitor coagulation assays |
| | Myelosuppression (neutropenia) 15%-25% | Do not initiate if ANC < 750/mm ³ If ANC < 500/mm ³ , withhold thalidomide until ANC > 500/mm ³ and restart at 50% lower dose |
| | Gastrointestinal (constipation) Mild: 80%-90% Severe: 5% | Bowel regimen (call office if no BM in 3 days) Increase fluid and fiber intake |

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