

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

<b>Bortezomib</b>		
<b>Drug Profile</b>	<b>Common Adverse Events</b>	<b>Nursing Management</b>
<b>Class:</b> Proteasome inhibitor <b>Indication:</b> Newly diagnosed MM <b>Dosing:</b> 1.3 mg/m <sup>2</sup> 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 <sup>2</sup> Grade 2 with pain or grade 3: hold until toxicity resolve; resume at 0.7 mg/m <sup>2</sup> 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 and reintroduce at a 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		
Class: Steroid	Common Adverse Events	Nursing Management
<b>Indication:</b> All active MM protocols <b>Dosing:</b> 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 <sub>2</sub> 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.

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

Lenalidomide			
<b>Class:</b> Immunomodulatory agent <b>Indication:</b> Newly diagnosed patients when combined with dexamethasone <b>Dosing:</b> 25 mg PO daily 21/28 days Dose modifications for renal impairment Variable dosing in combination regimens	<b>Common Adverse Events</b> Myelosuppression Neutropenia 28% (21% grade 3-4) Anemia 24% (8% grade 3-4) Thrombocytopenia 17% (10% grade 3-4)	<b>Nursing Management</b> 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	<b>Renal Impairment (CrCl)</b>	<b>Lenalidomide Dose</b>
		Moderate (30 to < 60 mL/min)	10 mg qd
		Severe (< 30 mL/min, not requiring dialysis)	15 mg q 48 hours
		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 symptomatic 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 Increase fluids Use of laxatives and stool softeners	
Usually mild intermittent cramping or diarrhea Modification of diet Use of antidiarrheal agents Rarely requires dose reduction			

Dimopoulos et al. *N Engl J Med.* 2007;357:2123-2186; Wang et al. *Blood.* 2008;112:4445-4451; Weber et al. *N Engl J Med.* 2007;357:2133-2142.

### Melphalan—Oral

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

<b>Class:</b> Alkylating agent <b>Indication:</b> Use in non-transplant-eligible MM patients for initial therapy <b>Dosing:</b> Variable dosing based on regimen	<b>Common Adverse Events</b>	<b>Nursing Management</b>
	Myelosuppression	Myelosuppression may be delayed with prolonged recovery
	Diarrhea	Usually mild intermittent cramping or diarrhea Modification of diet Use of antidiarrheal agents Rarely requires dose reduction

<b>Pegylated Liposomal Doxorubicin (PLD)</b>		
<b>Class:</b> Anthracycline	<b>Common Adverse Events</b>	<b>Nursing Management</b>
<b>Indication:</b> In combination with bortezomib for MM patients who have not previously received bortezomib and who have had at least 1 previous therapy <b>Dosing:</b> 30 mg/m <sup>2</sup> —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)	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	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
	<b>Black box warning:</b> Myocardial damage, acute infusion-related reactions, myelosuppression, hepatic dysfunction	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.

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

Thalidomide		
Class:	Common Adverse Events	Nursing Management
<b>Immunomodulatory agent</b> <b>Indication:</b> Newly diagnosed and relapsed refractory MM. Most often in combination with Dex or other agents <b>Dosing:</b> 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 <sup>3</sup> If ANC < 500/mm <sup>3</sup> , withhold thalidomide until ANC > 500/mm <sup>3</sup> , 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

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.