LETTER TO OUR READERS

Dear Colleague:

It is my pleasure to present another issue in our series of newsletters featuring topics relevant to your multidisciplinary team approach to caring for patients with multiple myeloma. This issue, entitled “Considerations in Multiple Myeloma: Health Economics,” provides an overview of economic issues related to myeloma therapy.

A faculty of hematologists/oncologists, oncology nurses, and oncology pharmacists help focus the discussion on one topic for each newsletter. While previous issues focused on patients with renal dysfunction, initial treatment of newly diagnosed patients, and hard-to-treat patient populations, this issue focuses on economic considerations. Our final issue will discuss the management of side effects related to myeloma therapies.

It is my sincere hope that the information presented here is of value to you in your care of patients with multiple myeloma.

Sincerely,

Sagar Lonial, MD
Associate Professor of Hematology and Oncology
Emory University

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Considerations in Multiple Myeloma:
Health Economics

Editor in Chief
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MULTIDISCIPLINARY TEAM PRESENTATIONS BY

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A nationally accredited continuing education company

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Target Audience
This educational publication is designed for physicians, nurses, and pharmacists who wish to enhance their knowledge concerning the health economics of multiple myeloma therapy.

Learning Objectives
At the completion of this educational activity, participants should be able to
• Review the current epidemiology of multiple myeloma (MM)
• Discuss the use of novel agents in the treatment of MM
• Review the results of health economics data related to the use of these agents for the treatment of patients with MM

Accreditation
Physicians
This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of CME Consultants and Center of Excellence Media. CME Consultants is accredited by the ACCME to provide continuing medical education for physicians.

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Faculty Disclosures

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jessica Freels, PharmD</td>
<td>Boehringer-Ingelheim</td>
<td>Spouse's employer</td>
</tr>
<tr>
<td>Laureen Kenealy, PharmD</td>
<td>Nothing to disclose</td>
<td></td>
</tr>
<tr>
<td>Jacob Kettle, PharmD</td>
<td>Nothing to disclose</td>
<td></td>
</tr>
<tr>
<td>Sandra E. Kurtin, RN, MS, AOCN, ANP-C</td>
<td>MGI Pharma Speaker honoraria</td>
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<tr>
<td>Novartis Speaker honoraria</td>
<td></td>
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<tr>
<td>Casey Williams, PharmD, BCOP</td>
<td>Nothing to disclose</td>
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<thead>
<tr>
<th>Name</th>
<th>Company</th>
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<tbody>
<tr>
<td>Jennifer Furlong</td>
<td>CMEC</td>
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<td>Samantha Mattucci, PharmD</td>
<td>Nothing to disclose</td>
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<tr>
<td>Ann DeQuattro, MS, BSN, RN</td>
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<td></td>
</tr>
<tr>
<td>Patrice French, BSN, RN</td>
<td>Nothing to disclose</td>
<td></td>
</tr>
<tr>
<td>Karen Cooksey</td>
<td>COE</td>
<td>Nothing to disclose</td>
</tr>
</tbody>
</table>

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Estimated Time to Complete This Activity: 1 hour

Date of original release: October 31, 2008
Valid for CME credit through: October 31, 2009
1  LETTER TO OUR READERS
   Sagar Lonial, MD

2  CME INFORMATION

5  THE HEALTH ECONOMICS OF MANAGING MULTIPLE MYELOMA

Mission Statement
Multidisciplinary Cancer Care newsletters provide a forum for sharing expert interdisciplinary treatment perspectives on patient care with the ultimate goal of promoting ongoing professional education to physicians, nurses, and pharmacists in the hematology/oncology community.

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TABLE OF CONTENTS

8  ECONOMIC CONSIDERATIONS IN THE TREATMENT OF MULTIPLE MYELOMA  
Sandra E. Kurtin, RN, MS, AOCN, ANP-C

11 HEALTH ECONOMICS: IMPLICATIONS FOR PHARMACISTS  
Jessica Freels, PharmD; Laureen Kenealy, PharmD; Jacob Kettle, PharmD;  
Casey Williams, PharmD, BCOP

13 POSTTEST

14 EVALUATION FORM
Multiple myeloma (MM) is a malignant neoplasm of plasma cells characterized by renal failure, anemia, hypercalcemia, and bone lesions. Although MM is the second most prevalent hematologic malignancy in the United States (after non-Hodgkin’s lymphoma), it is a relatively uncommon cancer—representing approximately 1.4% of all cancers. The American Cancer Society estimates that about 19,920 new cases of MM (11,190 in men and 8730 in women) will be diagnosed during 2008. Incidence increases with age, with a median age at diagnosis of approximately 70 years. About 10,690 Americans (5640 men and 5050 women) are expected to die of the condition in 2008. The 5-year relative survival rate for MM is around 34%, with survival higher in younger patients than in the elderly.

Traditional chemotherapeutic regimens for MM include combinations such as melphalan/prednisone and vincristine/doxorubicin/dexamethasone. In the 1980s, a significant breakthrough occurred with the introduction of myeloablation with autologous stem-cell transplantation, which was proven to be an effective initial treatment for patients with newly diagnosed MM. Patients’ quality of life has improved with the advent of bisphosphonates, which can prevent skeletal events that lead to bone pain and loss of mobility. More recently, promising new immunomodulatory agents have emerged that offer improved response rates, progression-free survival, and potential overall survival for patients with MM. The acquisition costs of these novel therapies, however, are high compared with some established treatments, such as corticosteroids. In today’s healthcare environment, important parameters to consider when assessing the value of treatments include not only safety and efficacy but also cost-effectiveness and cost-utility measures. Increasingly, healthcare systems are requiring health economic information as part of reimbursement submissions for novel therapies.

Over the past decade, treatment of MM has evolved due to the approval of the following therapies by the Food and Drug Administration (FDA):
- Bortezomib (Vel)—indicated for the frontline treatment of MM patients
- Bortezomib plus pegylated liposomal doxorubicin (Vel/Dox)—indicated for MM patients who have received at least 1 prior therapy
- Lenalidomide plus dexamethasone (Rev/Dex)—indicated for MM patients who have received at least 1 prior therapy
- Thalidomide plus dexamethasone (Thal/Dex)—indicated for newly diagnosed MM. In addition, this regimen is recommended as a therapeutic option for relapsed patients by the National Comprehensive Cancer Network’s Clinical Practice Guidelines in Oncology for MM.

At the 2007 annual meeting of the American Society of Hematology (ASH), Fullerton and colleagues presented the results of a budget-impact model evaluating the direct costs of these 4 FDA-approved MM therapies, including drug costs, medical costs, and the costs of managing adverse events (AEs).

**Drug Costs**

Calculation of drug costs (Figure 1) took into consideration the average wholesale price (AWP), discounts, copayments, and rebates. AWP for each product was obtained from the Red Book 2007; drug costs were calculated based on the AWP minus 15% with 10% (Thal/Dex, Rev/Dex) or 20% (Vel, Vel/Dox) patient coinsurance.

**Figure 1. Drug costs (per patient) associated with specific therapies for MM.**
Medical Costs

Medical costs (Figure 2) included evaluation and management, chemotherapy administration, hydration, laboratory tests, and prophylaxis. Costs of therapy were obtained from standard sources such as the Red Book or from peer-reviewed publications and/or meeting presentations. Duration of therapy (DOT) for 3 of the regimens was based on the published median DOT from their respective pivotal phase 3 studies: 6 cycles for Vel\textsuperscript{a} and Vel/Dox\textsuperscript{a,15} and 11 cycles for Rev/Dex.\textsuperscript{16} DOT for Thal/Dex (9 cycles) was based on the average DOT from 2 phase 2 studies,\textsuperscript{17,18} as it better reflected actual use. This analysis did not take into account differences in patient population or in efficacy, as efficacy could not be compared due to incomplete/inconsistent reporting of outcomes data in the prescribing information (PI) for the 4 regimens.

Adverse Event Costs

AE costs (Figure 3) included costs for treating the following:\textsuperscript{14}
- Anemia (grade 3/4)
- Diarrhea (grade 3/4)
- Herpes zoster virus
- Deep vein thrombosis (DVT)/pulmonary embolism (PE)
- Neutropenia (grade 3/4)
- Peripheral neuropathy (grade 3/4)
- Pneumonia
- Thrombocytopenia (grade 3/4)
- Vomiting (grade 3/4)

Costs of treating each AE were obtained from standard sources such as the Red Book or from peer-reviewed publications and/or meeting presentations. Incidence of AEs (all 5% grade 3/4 AEs or AEs that required significant resource utilization) and assumptions for supportive care/prophylaxis were obtained from the full PI for each of the 4 approved MM therapies. For key AEs with no information available in the PI, data were obtained from peer-reviewed publications. Specifically, the rates of febrile neutropenia and DVT/PE for Vel/Dox were obtained from the pivotal phase 3 trial,\textsuperscript{19} whereas the rates of grade 3/4 dyspnea and pneumonia grade 3/4 infections were inferred from a presentation by Orlowski and colleagues at the 2006 ASH annual meeting;\textsuperscript{20} the rate of febrile neutropenia for Rev/Dex was obtained from the pivotal phase 3 study.\textsuperscript{20}
HEALTH ECONOMICS

Total Costs
Total costs for the 4 regimens were substantially different, primarily driven by direct drug costs. Based on emerging clinical data, prophylaxis for herpes zoster virus (Vel, Vel/Dox) and DVT/PE (Rev/Dex, Thal/Dex) is now recommended. Thus, the investigators performed an additional analysis assuming appropriate prophylaxis as recommended in published literature and found that, since increased medical costs were offset by decreased AE management costs, total costs with or without prophylaxis did not differ substantially (Figure 4).14

Conclusions
The authors’ analysis showed a substantial difference in resource utilization for the 4 FDA-approved MM regimens, attributable mainly to direct drug costs, with Vel being the lowest and Rev/Dex the highest.14 Because this analysis did not account for differences in patient population or in efficacy due to incomplete/inconsistent reporting of outcomes data in the PIs for the 4 regimens, a complete cost-effectiveness model would be warranted as more outcomes data become available.

References
ECONOMIC CONSIDERATIONS

ECONOMIC CONSIDERATIONS IN THE TREATMENT OF MULTIPLE MYELOMA

Sandra E. Kurtin, RN, MS, AOCN, ANP-C, Arizona Cancer Center, Tucson, AZ

Multiple myeloma (MM) is considered a highly treatable but rarely curable disease. Recent therapeutic advances have led to improved survival and quality of life (QoL) for patients with the disease. Thirty years ago, the 5-year survival rate for patients with newly diagnosed MM in the United States was 26%; it is now estimated to be approximately 33%. MM is commonly referred to as a chronic disease, and patients often require years of ongoing treatment and follow-up care.

It is estimated that chronic diseases account for 70% of all deaths and 75% of all healthcare costs. The exponential rise in healthcare expenditure, an increase of approximately $100 billion per year with an estimated $1.5 trillion total healthcare expenses in 2005, has created a mandate for cost analysis of cancer care. Oncology clinicians should be familiar with at least basic cost-benefit analyses pertaining to the treatment of MM, so they are better able to implement cost-effective management strategies that will provide optimal clinical outcomes with acceptable toxicity.

Cost-Benefit Analysis in Cancer Care

Cost-benefit analysis in healthcare is complex; there are several systems for analysis that may produce varied outcomes measures. The accurate comparison of historical best practices with newer therapies, including indirect costs of care, is further complicated by recent changes in diagnostic, staging, and treatment outcome variables. In the case of MM, the rate at which these variables have changed is staggering. The analysis of new therapies for cancer has typically focused on efficacy and safety, with the desired clinical trial endpoint of response. Recently, there has been a shift toward overall survival (OS) and progression-free survival in clinical trials, including those for MM. This shift is due, in part, to lack of improvement in OS despite evidence of response in historical clinical trials using standard therapy with chemotherapeutic agents and steroids.

Extended survival, however, may actually increase resource utilization, as well as costs, as patients will continue to require monitoring and clinical management of their disease. In addition, it is difficult to attribute improved survival to one specific therapeutic intervention. It may be more realistic to consider overall health management by both the medical community and the patient/caregiver.

The value of survival is often described in terms of productivity and quality adjusted life-years, which take into account individual performance status and health status. Accurate assessment of the cost-effectiveness of a specific intervention, with consideration of the impact of that intervention on both QoL and survival, requires more complex measures of health-related QoL.

In the past decade, several critical events have changed the diagnostic, prognostic, and treatment strategies for multiple myeloma.

Evaluating Cost-Effectiveness of MM Therapy

The heterogeneous nature of MM, including variations in cytogenetics, molecular attributes, and disease presentation, presents challenges when evaluating the clinical outcomes of therapy. In the past decade, several critical events have changed the diagnostic, prognostic, and treatment strategies for the disease. Recent scientific advances and the incorporation of recommendations into clinical practice will promote data-driven clinical management of MM. However, it is uncertain if these advances will result in improved utilization of resources because many of the recommendations are very recent and full analysis of clinical benefit will require long-term follow-up. In addition, it is generally accepted that economic data generated from cancer clinical trials are not necessarily representative of the general population of patients, who tend to be older with more comorbid conditions.
Improving Patient Outcomes in MM

The ultimate goal for any cancer clinical trial is improved survival, QoL, and utilization of resources. Several clinical management strategies have the potential to support these outcomes in MM. The recent development of the International Staging System, identification of cytogenetic and molecular attributes associated with prognosis, and refinement of diagnostic studies, such as serum free light chain analysis, have led to improved treatment selection and monitoring⁷,⁸,¹¹ (Table 1). Furthermore, simplification of risk analysis, the refinement of criteria used to determine eligibility for stem-cell transplant, and other recent scientific developments have facilitated individualized treatment plans aimed at promoting better long-term outcomes (Table 2).⁹

The International Myeloma Foundation Nurse Leadership Board recently published consensus statements that offer specific guidelines, strategies, and recommendations for the management of key side effects associated with MM therapies.¹² Effective management of these toxicities can increase adherence to treatment, improve patient QoL, reduce treatment delays and/or dose reductions, and prevent serious toxicities that may lead to prolonged hospitalization and increased morbidity and mortality.¹³ The potential clinical/economic impact of these recommendations, as well as other recent scientific developments in the diagnosis and treatment of MM, are shown in Table 3.

It is a time of great hope for patients with MM and the oncology clinicians who treat them. However, it is evident that many clinical and economic outcomes related to the management of the disease require ongoing analysis. Improving clinical trial participation with inclusion of economic and QoL measures will help to characterize the full spectrum of outcomes associated with specific therapies. Postmarketing analysis will also be necessary to complete a comprehensive economic evaluation of novel therapies used to treat MM.

Table 1. Cytogenetic and Molecular Attributes Associated with Prognosis

<table>
<thead>
<tr>
<th>Cytogenetics</th>
<th>Additional High-risk Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>High risk: t(4;14)(p16;q32), t(14;16)(q32;q23), -17p13 (median survival 25 months)</td>
<td>• Age &gt;70 years</td>
</tr>
<tr>
<td>Intermediate risk: -13q14 (median survival 42 months)</td>
<td>• Creatinine &gt;2 mg/dL</td>
</tr>
<tr>
<td>Favorable: all others (median survival 50 months)</td>
<td>• Platelet count &lt;150,000/mm³</td>
</tr>
</tbody>
</table>
| • Reduced dexamethasone dosing in combination with lenalidomide 
  (eliminates the need for uniform anticoagulation and monitoring) | • Performance status 3 or 4 |
| • Identification of complete remission sustained 3 years from treatment as a surrogate for extended survival | • Relapse <12 months from transplant or other first-line therapy or relapse on therapy |

Table 2. Recent Scientific Developments in Multiple Myeloma

- Risk-adapted treatment selection
- FDA approval of novel agents (thalidomide, lenalidomide, bortezomib)
- Reduced-intensity conditioning regimens for stem-cell transplantation
- Identification of potential toxicities associated with long-term bisphosphonate therapy
- Incorporation of treatment guidelines for patients with renal impairment
- Development of consensus statements for toxicity management

FDA indicates Food and Drug Administration; NCCN, National Comprehensive Cancer Network; mSMART, Mayo Stratification of Myeloma And Risk-adapted Therapy.

References
10. Katzel J, Hari P, Vesole D. Multiple myeloma:

| Table 3. Economic/Clinical Impact of Select Scientific Developments in Multiple Myeloma |
|---------------------------------|---------------------------------------------------------------|
| Scientific Developments | Potential Clinical/Economic Impact |
| Implementation of a continuum approach to treatment selection using a risk-adapted treatment model for MM | • Patient-specific treatment selection that may improve clinical outcomes by employing the most beneficial treatment option early in the course of the disease  
• Elimination of ineffective therapies with poor toxicity profiles  
• Preservation of future treatment options  
• Refined utilization of diagnostics and therapeutics |
| Management of myelosuppression13 | • Reduction in treatment delays or discontinuation  
• Reduction in hospitalization due to neutropenic fever  
• Improvement in patient satisfaction/QoL |
| Management of thromboembolic events14 | • Reduction in treatment delays or discontinuation  
• Reduction in cost of anticoagulation monitoring  
• Decreased incidence of thromboembolic events |
| Management of peripheral neuropathy15 | • Continuation of effective therapies  
• Improvement in patient productivity/QoL  
• Reduction in pain associated with peripheral neuropathy |
| Management of steroid-associated toxicities16 | • Reduction in infectious complications  
• Reduction in thromboembolic events  
• Improvement in patient QoL |
| Management of gastrointestinal toxicities17 | • Reduction in treatment delays or dose reduction  
• Reduction in hospitalization due to dehydration  
• Improvement in patient QoL |
| Use of electronic medical records and dissemination of accurate patient and caregiver education | • Reduction in drug-drug interactions, contraindications, or duplication of services  
• Improved patient satisfaction |

MM indicates multiple myeloma; QoL, quality of life.
Multiple myeloma (MM) is a plasma cell malignancy projected to be diagnosed in approximately 20,000 patients in the United States in 2008. With the routine incorporation of the novel agents thalidomide, lenalidomide, and bortezomib into most frontline treatment regimens, response and remission rates have improved in all stages of the disease. However, the follow-up in most clinical trials is not of sufficient duration to declare that overall survival has been positively impacted. Currently, outside of a clinical trial, there is no true "gold standard" frontline treatment for both transplant-eligible and transplant-ineligible patients.

Economic Considerations in the Treatment of MM

In today’s healthcare environment, safety and efficacy are still the primary parameters evaluated to assess the utility of a particular treatment. However, as acquisition prices of newer therapies continue to rise, cost and cost-effectiveness are becoming increasingly important. Pharmacoeconomic evaluations of recent advances in MM therapy are still lacking. Consequently, insurance companies and other third-party payers are demanding more clinical evidence and data review before providing reimbursement.

Outside of a clinical trial, most practitioners will incorporate an individualized treatment approach that takes into account a patient’s performance status, cytogenetics, stage, and comorbidities prior to initiating treatment. For newly diagnosed MM patients younger than 65 years without significant comorbidities, initial therapy should incorporate at least one novel agent in combination with dexamethasone followed by a planned autologous hematopoietic stem-cell transplant. The efficacy of each combination may vary in select patient populations.

For nontransplant candidates, primary regimens that incorporate melphalan and prednisone (MP), plus a novel agent, such as thalidomide, are generally considered the standard of care. MP is also being evaluated in combination with lenalidomide and bortezomib.

In addition to clinically relevant patient factors, the overall financial burden to the health care system needs to be assessed. Table 1 illustrates the medication costs per cycle for several commonly used regimens for MM based on average wholesale pricing. Patients’ out-of-pocket expenses, however, may vary greatly depending on factors such as mode of administration and supportive care requirements.

Table 1. Common Chemotherapy Regimens for Multiple Myeloma and Average Cost per Cycle

<table>
<thead>
<tr>
<th>Regimen</th>
<th>One Cycle Cost*</th>
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<tbody>
<tr>
<td>Melphalan 7 mg/m² orally x 4 days</td>
<td>$47.60</td>
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<tr>
<td>Prednisone 100 mg orally x 4 days</td>
<td></td>
</tr>
<tr>
<td>Repeat every 4 weeks</td>
<td></td>
</tr>
<tr>
<td>Dexamethasone 40 mg orally daily on Days 1-4, 9-12, 17-20</td>
<td>$180.00</td>
</tr>
<tr>
<td>Repeat every 4-6 weeks</td>
<td></td>
</tr>
<tr>
<td>Thalidomide 200 mg orally daily x 21 days</td>
<td>$7871.04</td>
</tr>
<tr>
<td>Dexamethasone 40 mg orally daily on Days 1-4, 9-12, 17-20</td>
<td></td>
</tr>
<tr>
<td>Repeat every 4 weeks</td>
<td></td>
</tr>
<tr>
<td>Lenalidomide 25 mg orally on Days 1-21</td>
<td>$8014.98</td>
</tr>
<tr>
<td>Dexamethasone 40 mg orally on Days 1, 8, 15, 22</td>
<td></td>
</tr>
<tr>
<td>Repeat every 4 weeks</td>
<td></td>
</tr>
<tr>
<td>Bortezomib 1.3 mg/m² intravenously on Days 1, 4, 8, 11</td>
<td>$3760.00</td>
</tr>
<tr>
<td>Repeat every 3 weeks</td>
<td></td>
</tr>
<tr>
<td>Melphalan 200 mg/m² intravenously (prior to transplant)</td>
<td>$13,512.00</td>
</tr>
</tbody>
</table>

Regimens listed are common dosing regimens and may be prescribed differently based on physician preference. *Weight based on m² = 1.8.
Intravenous therapies, such as bortezomib, given primarily in an outpatient clinic, may be more affordable for patients with limited prescription coverage and may be more financially appealing to practitioners. Conversely, both lenalidomide and thalidomide are available orally, but prescribing and dispensing restrictions may limit access for some patients and reduce reimbursement for prescribers. Supportive care and management of adverse effects comprise an often overlooked component of the total cost of therapy for patients with MM. For instance, the use of thalidomide and lenalidomide increases a patient’s risk of thromboembolism and requires prophylactic anticoagulation. In some cases, the costs associated with preventing or treating the side effects of a particular primary therapy may be equal to or greater than the expense of treating the disease (Table 2). Additional adverse effects associated with the use of thalidomide, lenalidomide, and bortezomib in the treatment of MM are listed in Table 3.

**Conclusion**

Despite therapeutic advances in the frontline setting, almost all patients with MM will eventually relapse. Further investigation will be necessary to assess the safety and overall efficacy of combinations incorporating novel agents in both the frontline and relapsed settings. However, since bortezomib, lenalidomide, and thalidomide are already in widespread clinical use, it is essential that rigorous pharmacoeconomic review be performed before a gold standard can be established.

**References**


**Table 2. Supportive Care Costs Associated with Anticoagulation at Treatment Doses**

<table>
<thead>
<tr>
<th>Agent</th>
<th>Cost per Month</th>
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<tbody>
<tr>
<td>Enoxaparin 80 mg twice daily</td>
<td>$4140.00*</td>
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<tr>
<td>Warfarin 5 mg daily</td>
<td>$14.00</td>
</tr>
<tr>
<td>Aspirin 325 mg daily</td>
<td>$4.00</td>
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*Based on average wholesale price. Dosing based on 80-kg patient.

**Table 3. Adverse Effects Associated with Novel Agents**

<table>
<thead>
<tr>
<th></th>
<th>Thalidomide</th>
<th>Lenalidomide</th>
<th>Bortezomib</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myelosuppression</td>
<td>No</td>
<td>Yes (dose-dependent)</td>
<td>Yes (transient)</td>
</tr>
<tr>
<td>Peripheral neuropathy</td>
<td>Yes (irreversible)</td>
<td>No (reversible)</td>
<td>Yes</td>
</tr>
<tr>
<td>Thrombosis</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Herpes zoster reactivation</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
1. Which of the following statements is **TRUE** regarding the epidemiology of multiple myeloma (MM)?
   a. MM is the most prevalent hematologic malignancy in the United States.
   b. MM is a relatively common cancer—representing approximately 14% of all cancers.
   c. In 2008, approximately 19,920 new cases of MM will be diagnosed in the United States.
   d. The median age at diagnosis is approximately 50 years.

2. What is the approximate 5-year relative survival rate for patients diagnosed with MM?
   a. 24%
   b. 34%
   c. 44%
   d. None of the above

3. Which of the following statements is **FALSE**?
   a. Melphalan/prednisone and vincristine/doxorubicin/dexamethasone are traditional treatments for MM.
   b. Autologous stem-cell transplantation has been proven to be an effective initial treatment for patients with newly diagnosed MM.
   c. Bisphosphonates are used to prevent skeletal events, which lead to bone pain and loss of mobility.
   d. None of the above

4. Which of the following regimens have been approved by the Food and Drug Administration (FDA) for the treatment of MM patients?
   a. Bortezomib (Vel) monotherapy
   b. Bortezomib plus pegylated liposomal doxorubicin (Vel/Dox)
   c. Lenalidomide plus dexamethasone (Rev/Dex)
   d. All of the above

5. At the 2007 annual meeting of the American Society of Hematology (ASH), Fullerton and colleagues presented the results of a budget-impact model evaluating the direct costs of 4 FDA-approved MM therapies—Vel, Vel/Dox, Rev/Dex, and Thal/Dex—including which of the following?
   a. Drug costs
   b. Medical costs
   c. Costs of managing adverse events
   d. All of the above

6. Which of the following statements is **TRUE** regarding the analysis of medical costs in the study by Fullerton and colleagues?
   a. Cost factors included evaluation, management, chemotherapy administration, hydration, laboratory tests, and prophylaxis.
   b. Efficacy of treatment was included in the analysis.
   c. Differences in patient population were included in the analysis.
   d. None of the above.

7. In the analysis by Fullerton and colleagues, which of the following treatments was associated with the lowest medical costs?
   a. Vel/Dox
   b. Rev/Dex
   c. Vel
   d. Thal/Dex

8. Which of the following statements is **TRUE** regarding the conclusions of the study by Fullerton and colleagues?
   a. Total costs for Vel, Vel/Dox, Rev/Dex, and Thal/Dex were substantially different.
   b. Total costs for each of the therapies were primarily driven by direct drug costs.
   c. The analysis showed a substantial difference in resource utilization for the 4 regimens, with Vel being the lowest and Rev/Dex the highest.
   d. All of the above

9. Fullerton and colleagues performed an additional analysis assuming prophylaxis for herpes zoster and deep vein thrombosis/pulmonary embolism, based on recommendations in published literature. What were the results of this analysis?
   a. The total costs with prophylaxis were substantially higher for Vel and Vel/Dox.
   b. The total costs with and without prophylaxis did not differ substantially.
   c. The total costs with prophylaxis were substantially higher for Thal/Dex than Rev/Dex.
   d. None of the above

10. Which of the following statements is **FALSE** regarding the health economics analysis by Fullerton and colleagues?
    a. It did not account for differences in patient population or in efficacy.
    b. Efficacy could not be compared due to incomplete/inconsistent reporting of outcomes data in the prescribing information for the regimens.
    c. A complete cost-effectiveness model is warranted as more outcomes data become available.
    d. None of the above
EVALUATION FORM

Considerations in Multiple Myeloma: Health Economics
Project ID: JE8027415

To assist us in evaluating the effectiveness of this activity and to make recommendations for future educational offerings, please take a few minutes to complete this evaluation form. You must complete this evaluation form to receive acknowledgment for completing this activity.

Please answer the following questions by circling the appropriate rating:

1 = Strongly Disagree  2 = Disagree  3 = Neutral  4 = Agree  5 = Strongly Agree

Extent to Which Program Activities Met the Identified Objectives
After completing this activity, I am now better able to:

Review the current epidemiology of multiple myeloma (MM)  1  2  3  4  5

Discuss the use of novel agents in the treatment of MM  1  2  3  4  5

Review the results of health economics data presented at the 2007 annual meeting of the American Society of Hematology using these agents for the treatment of MM  1  2  3  4  5

Overall Effectiveness of the Activity
The content presented:

Was timely and will influence how I practice  1  2  3  4  5

Enhanced my current knowledge base  1  2  3  4  5

Addressed my most pressing questions  1  2  3  4  5

Provided new ideas or information I expect to use  1  2  3  4  5

Addressed competencies identified by my specialty  1  2  3  4  5

Avoided commercial bias or influence  1  2  3  4  5

Impact of the Activity
Name one thing you intend to change in your practice as a result of completing this activity:

___________________________________________________________________________________________________________

___________________________________________________________________________________________________________

Please list any topics you would like to see addressed in future educational activities:

___________________________________________________________________________________________________________

___________________________________________________________________________________________________________
EVALUATION FORM

Considerations in Multiple Myeloma: Health Economics
Project ID: JE8027415

Additional comments about this activity:
___________________________________________________________________________________________________________
___________________________________________________________________________________________________________

Follow-up
As part of our continuous quality improvement effort, we conduct postactivity follow-up surveys to assess the impact of our educational interventions on professional practice. Please indicate if you would be willing to participate in such a survey:

☐ Yes, I would be interested in participating in a follow-up survey.
☐ No, I’m not interested in participating in a follow-up survey.

If you wish to receive acknowledgment for completing this activity, please complete the posttest by selecting the best answer to each question, complete this evaluation verification of participation, and fax to: (303) 790-4876.

You may also complete the posttest online at www.cmeuniversity.com. Click on “Find Posttest/Evaluation by Course” on the navigation menu, and search by project ID JE8027415. Upon successfully completing the posttest and evaluation, your certificate will be made available immediately.

Posttest Answer Key

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Request for Credit (check box): MD ☐ RN ☐ Pharm ☐ Other ☐

Name _____________________________________________ Degree __________________________
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Signature _____________________________ Date ____________________

For Physicians Only
I certify my actual time spent to complete this educational activity to be:

☐ I participated in the entire activity and claim 1.0 credits.
☐ I participated in only part of the activity and claim ____ credits.
Traditional educational activities (e.g., live meetings or lectures, printed or internet-based CME activities) may make you aware of new information, illuminate associated healthcare quality gaps, and even provide you with the rationale or evidence-based information for improving care of your myeloma patients. However, they usually do not offer any further support in the successful application of the learning in your practice and improving the care of your patients.

MedCases is pleased to notify you of an upcoming innovative multi-faceted opportunity to improve the quality of care for your multiple myeloma patients. This unique initiative combines education with practice-based application. You will:

- Treat virtual patients in 6 online interactive case simulations that offer up to 12 free AMA PRA Category 1 credits™. Learn about recent updates to the national guidelines and other current evidence, and how best to apply them in different patient scenarios.

- Take the learning into your practice with the unique Performance Improvement (PI) CME process that offers up to 20 additional free AMA PRA Category 1 credits™. Step through an expert-led structured mechanism to identify, implement, and evaluate specific improvements in your practice.

The case simulations and PI-CME activity will be available mid-November at www.challengingcases.com

We look forward to your participation in this comprehensive educational experience.