**BACKGROUND**

With the increasing adoption of immunotherapy, 2015 witnessed continued and unparalleled changes in treatment approaches for metastatic melanoma which have greatly improved overall survival and quality of life for patients with the disease. Although these changes in care provide significant hope to patients with melanoma, it is unclear if all oncologists have sufficient knowledge and competence to effectively incorporate this evidence base into their practices. The objective of this study was to evaluate oncologists’ competence and performance in the management of metastatic melanoma and the impact of case-based education on narrowing gaps in their clinical practices.

**METHODS**

**Curriculum Design**
Using a unique online, education environment (http://www.medscape.org/sites/advances/waitingroom/immunotherapy-metastatic-melanoma) that employs video vignettes to mimic an oncologist’s waiting room, learners were provided an opportunity to preview the presentation of up to 3 unique patient cases (Figure 1). Each of the 3 cases required oncologists to make real-world clinical decisions to appropriately manage patients with metastatic melanoma. The 3 patient cases were launched as separate activities on September 25, 2015, and data were collected through January 17, 2016.

**Study**
Within an online survey format, each activity consisted of a case-based scenario, associated performance assessment and self-efficacy questions, and demographic questions. Each multiple-choice, performance assessment question was mapped to a learning objective and was derived from recognized measures, guidelines, and current evidence-based citations. Each participant’s responses to questions posed both before and immediately after exposure to the case were captured and compared. Thus, learners’ linked responses showed the impact of education on the level of individual learners.

**Analysis**
The Microsoft Excel 14.0 calculation engine was used to generate algorithms for calculations of the t-tests, McNemar’s analysis, and descriptive data. Participant responses to performance questions were scored according to their concordance with the evidence-informed content presented within the activity.

**RESULTS**

At the time of data collection, 1,342 oncologists had participated in at least one of the 3 activities. An outcomes assessment was conducted for 100 participants who had completed all pre- and post-assessment questions. Overall, the education resulted in statistically significant knowledge and skill gains among oncologists for all 3 activities. With effect sizes ranging between .222 (medium) and .551 (large) upon completion of the education activities, there was significant (all \( P < .05 \)) improvement in oncologists’ ability to:

- Identify the most appropriate evidence-based regimen, including possible use of immune checkpoint inhibitors, for a patient with BRAF wild-type (Figure 2) or BRAF-mutated disease in the first-line setting (Figure 3).
- Select the most appropriate second-line regimen for a patient whose disease has progressed based on prior therapy (Figure 4A) as well as BRAF-status and tumor burden (Figure 4B).
- Properly manage (Figure 5) immune-related adverse events related to treatment with cancer immunotherapies.

**CONCLUSION**

Use of online, case-based CME improved competence and performance among participating oncologists, showing that use of unique platforms that mimic patient care can be an effective tool to improve clinical decision making in the rapidly changing environment of metastatic melanoma disease management. Moreover, while not the focus of this study, examination of the impact of the education on oncologists’ competence and performance showed similar gains.

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**FIGURE 1. Management of Immune-Related Adverse Events**

Ralph, a 42-year-old man with symptoms of immune-related adverse events was treated with steroids that were tapered off over 40 days. Two weeks after the steroids finished, his symptoms of nausea, vomiting, and diarrhea reappeared. A CT scan showed stranding of the kidneys. Can you make the diagnosis now?

**FIGURE 2. Appropriate Management of a Patient With BRAF Wild-Type Metastatic Melanoma**

Maureen is diagnosed with stage IV melanoma. No BRAF mutation is identified. She is a candidate for immunotherapy. In considering immunotherapy for this patient, which of the following approaches may offer the best chance for success based on clinical trials?

**FIGURE 3. Appropriate Management of a Patient With BRAF-Mutated Metastatic Melanoma**

Maureen is diagnosed with stage IV melanoma. No BRAF mutation is identified. She is a candidate for immunotherapy. In considering immunotherapy for this patient, which of the following approaches may offer the best chance for success based on clinical trials?

**FIGURE 4. Appropriate Treatment Selection for a Patient that has Progressed on Prior Therapy**

A. Cynthia was prescribed ipilimumab. After an initial reduction in disease burden, her imaging now shows stable progression of disease at 12 months. She is experiencing fatigue, and her performance status is now Eastern Cooperative Oncology Group (ECOG) 1. Outside of a clinical trial, there are 2 treatment approaches that would be most appropriate to consider for this patient. One is dabrafenib plus trametinib (BRAF + MEK inhibition), and the other is which of the following?

**FIGURE 5. Recognition and Diagnosis of Immune-Related Adverse Events**

Ralph, a 42-year-old man with symptoms of immune-related adverse events was treated with steroids that were tapered off over 40 days. Two weeks after the steroids finished, his symptoms of nausea, vomiting, and diarrhea reappeared. A CT scan showed stranding of the kidneys. Can you make the diagnosis now?