Lung cancer is the leading cause of cancer-related deaths in the United States. Since 2006, a steady stream of data has demonstrated that advanced non-small cell lung cancer (NSCLC) cannot be considered or treated as a single disease entity. Rather, advanced NSCLC must be seen as a heterogeneous condition that is divided into histological and molecular subtypes with targeted and chemotherapeutic strategies. The ability to use tumor-specific characteristics to make treatment decisions has revolutionized the landscape for lung cancer care and research. As a result, most NSCLC experts find the diagnosis of NSCLC, not otherwise specified (NOS), to be largely unacceptable.

Despite this, numerous data sources continue to reveal deficits in physicians’ knowledge, skills, and confidence related to the application of relevant clinical, histologic, and genomic characterization of tumors to treatment decision-making for patients with advanced NSCLC. The objective of this study was to evaluate the impact of a baseline case-vignette assessment followed by a personalized learning plan designed to improve oncologist education in this era of personalized medicine for oncologists who care for patients with advanced NSCLC.

This educational initiative comprised a baseline self-assessment and 20 CME-certified activities. Learner-directed assessment questions were aligned with the learning objectives of 1 or more of the 5 educational activities.

- Content of individual activities addressed knowledge and practice gaps identified in the needs assessment.
- Assessment questions were repeated within activities to serve as a post-assessment for the education.
- Content addressed identified physician knowledge and clinical practice gaps.

Learners began the initiative by completing the self-assessment case vignette to provide an assessment of baseline knowledge and practice patterns.

Immediate personalized feedback and an individualized educational plan were provided upon each participant’s completion of the self-assessment. Included within each individualized plan were:

- A self-assessment and recommended activities;
- A tailored communication and educational reinforcement plan to encourage continued participant engagement through the completion of the program.

The baseline self-assessment and the educational activities were posted online simultaneously. Each activity contained 2 post-activity assessment questions derived from the baseline self-assessment instrument. Responses to the questions were collected and aggregated for comparative analysis of the post-assessment responses relative to the participants’ baseline self-assessment responses to aligned questions. This aggregate comparison served as a measure of the impact of the educational activity in improving the knowledge, skill, or performance of the baseline participants.

In total, 92 oncologists completed their individualized learning plans. Oncologists participating in the personalized learning saw an average of 9 patients with advanced NSCLC per month, with 52% seeing 1 to 5 new patients with advanced disease per month. This personalized learning intervention was associated with an effect size of 0.70, exceeding the recognized medium effect size standard of 0.45 to 0.50. Specific educational impact findings included:

- 13% improvement over baseline in ability to identify the rationale for determining the histological subtype of NSCLC.
- 41% of oncologists compared with 53% at baseline, (P=0.01) were aware of which patients could be considered for maintenance therapy.
- 57% compared with 76% at baseline, (P=0.04) were able to correctly identify the prevalence of specific genetic abnormalities.

With an overall effect size of 0.70, this study demonstrates the feasibility of a personalized, targeted educational intervention for improving practice patterns of oncologists treating patients with advanced NSCLC. However, there remain several post-education gaps in the management of advanced NSCLC, including:

- 23% of oncologists would still inappropriately prescribe a taxanes/and/or bevacizumab-based regimen in a 70-year-old male smoker with advanced NSCLC, squamous cell carcinoma.
- Almost 35% of oncologists will incorrectly identify the ARMS and ALK translocations as being more prevalent than KRAS mutations. In an area where molecular profiling is still a work in progress, but cost effectiveness is of high importance, it is critical that oncologists are able to identify which mutations, and therefore which targets, are most relevant for their patients in order to maximize outcomes while minimizing costs.

Conclusions