**Project Title**: Biomarker Testing Rates in Metastatic Non-Small Cell Lung Cancer

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**Background/Purpose**:

Biomarker testing is recommended in advanced and metastatic non-small cell lung cancer (mNSCLC) to determine therapy by the National Comprehensive Cancer Network, European Society for Medical Oncology, and American Society of Clinical Oncology. Furthermore, the College of American Pathologist (CAP), International Association for the Study of Lung Cancer (IASLC), and Association for Molecular Pathology (AMP) guideline recommends a standard biomarker testing turnaround time of less than 14 days to direct potential targeted therapy. Despite compelling evidence to support biomarker testing, the MYLUNG Consortium study revealed that less than 50% of patients received all recommended biomarker tests in community-based oncology practices. The purpose of this project was to evaluate baseline biomarker testing rates for mNSCLC patients within the YNHHS.

**Methods**:

An IRB exemption approval was obtained. A retrospective chart review of all patients with newly diagnosed mNSCLC from June 1, 2021 through May 31, 2022 was performed. Patients from satellite oncology practices and main cancer center within YNHHS were included. Patients at least 18 years of age who had a minimum follow-up duration of at least 30 days after first line treatment initiation during the study timeframe were included. Patients were excluded if they had more than one concurrent primary cancer. The primary endpoint was to assess biomarker testing rates for mNSCLC patients. Secondary endpoints included key turnaround times for diagnosis to test order, test order to test results, test results to first line treatment, and diagnosis to first line treatment. Descriptive statistics was performed to complete the data analysis portion of this study.

**Results:**

One-hundred and forty-four patients met inclusion criteria. The biomarker testing rate was 93.8% in the overall patient population and 99.2% in the non-squamous patient population. When assessing for patients who received all 4 biomarkers (EGFR, ALK, ROS1 BRAF), the testing rate was 90.3% in the overall patient population and 97.5% in the non-squamous patient population. One-hundred and five patients (72.9%) had biomarker test results and started first line treatment within the study timeframe. Of the 105 patients, 88 patients (83.8%) received biomarker test results before first line treatment initiation. The median days from diagnosis to test order was 2 days, test order to test results was 17 days, test results to first line treatment was 17 days, and diagnosis to first line treatment was 42 days. Only 16.2% of patients with biomarker test orders had results available within 14 days. The median age was 72 years. Nearly 85% of the patients were of non-squamous origin. Eighty-two patients (56.9%) were from satellite oncology practices and the remaining 62 patients (43%) from the main cancer center. Out of the 144 patients, 135 patients (93.8%) received biomarker test orders. Only 17 (12.6%) of those biomarker tests were performed externally. Thirty patients (22%) were identified with driver mutations, with the majority being EGFR mutations.

**Conclusion:**

This study revealed that more than 90% of patients at YNHHS had biomarker test orders for mNSCLC, and over 80% of patients received biomarker testing results prior to first line treatment initiation. The high testing rates reflect the application of evidence-based practice through following current guideline recommendations for biomarker testing. However, only 16% of patients met CAP/IASLC/AMP recommendations of receiving biomarker results within 14 days to direct therapy. Future directions include operationalizing a best practice model for both ordering biomarker tests and obtaining test results in a timely manner. Other steps would be to identify barriers, explore strategies to minimize turnaround times, and potentially establish recommendations for turnaround time from biomarker test results to first line treatment.