Receipt of Biomarker Testing in Non-Small Cell Lung Cancer: Using Real-World Data to Identify Testing Gaps and Treatment Characteristics

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INTRODUCTION

- Lung Cancer is the leading cause of cancer mortality in the US.
- The National Comprehensive Cancer Network (NCCN) recommends biomarker testing for all patients with newly diagnosed non-small cell lung cancer (NSCLC), especially for metastatic disease.
- Prior studies demonstrate sub-optimal rates of biomarker testing and guideline concordant therapy.

OBJECTIVE

To assess the current biomarker testing landscape among patients diagnosed with lung cancer to better understand those who do and do not receive biomarker testing and targeted therapy, the timing of testing relative to receipt of targeted therapy, and how these findings vary by age, sex, comorbid conditions, socioeconomic status, payer type, geographic region, and year.

METHODS

- A longitudinal retrospective study of patients diagnosed with lung cancer was conducted using a national multi-payer claims database.
- The database contains 170 million patients and over 79 billion commercial, Medicare, Medicaid, employer-sponsored, worker's compensation, and out of pocket claims across all US states and territories from 1/1/2010-4/30/2023.
- Patients >/=20 years with two lung cancer diagnoses 30 days apart were identified using International Classification of Diseases (ICD) codes-9 and -10.
- Testing was identified by Current Procedural Terminology (CPT) codes.
- Targeted therapy was identified using National Drug Codes (NDCs).
- The National Cancer Institute Comorbidity Index was used.

RESULTS

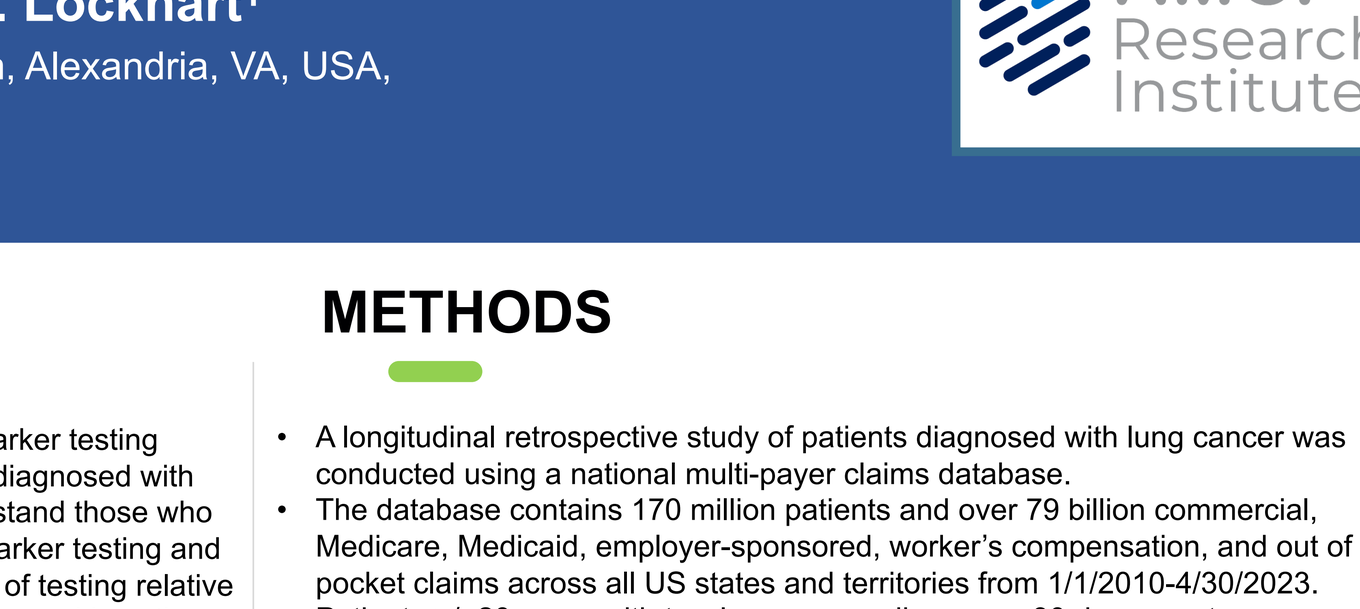
628,791 (**45.9%**) had biomarker testing

1,371,266 US patients with lung cancer

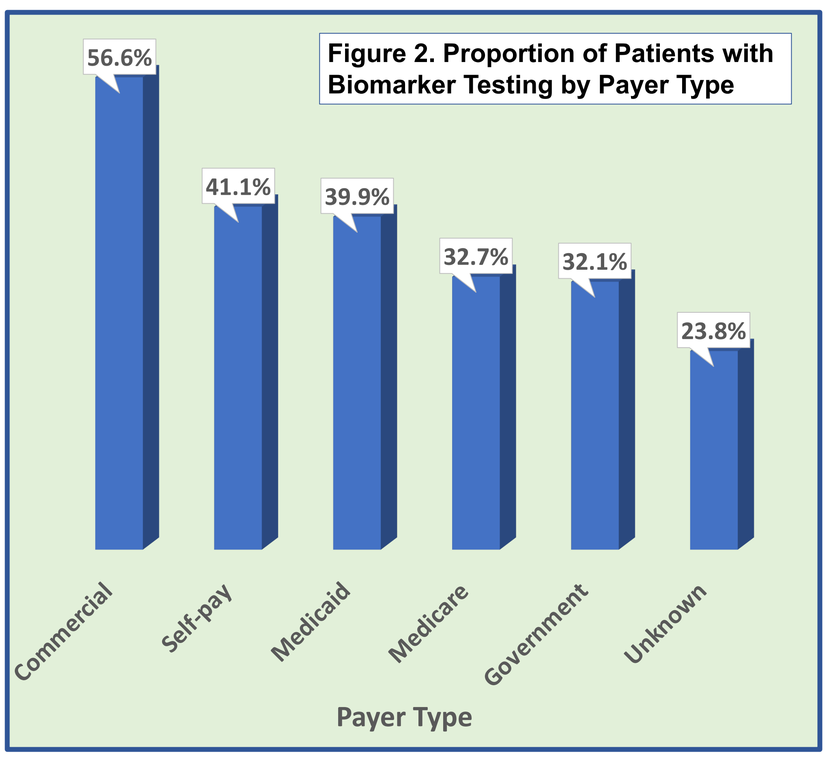
Table 1. Initial Biomarker Tests by CPT Code

CPT	Description	n	%
88341	Immunohistochemistry/Cytohistochemistry	277,688	44.2
88342	Immunohistochemistry (tissue immunoperoxidase)	244,709	38.9
88360	Morphometric analysis tumor immunohistochemistry (e.g. HER2/neu)	32,749	5.2
81235	EGFR gene analysis (common variants)	21,521	3.4
81479	Unlisted molecular pathology procedure	6,045	1.0
88368	Morphometric analysis, in situ hybridization	5,887	0.9
86316	Immunoassay for tumor antigen	5,371	0.9
81401	Molecular pathology procedure level 2	5,309	0.8
88237	Tissue culture for neoplastic disorders	3,777	0.6
84999	Unlisted chemistry procedure	3,466	0.6
88271	Molecular cytogenetics; DNA probe (e.g. FISH)	3,285	0.5
88344	Immunohistochemistry/Cytohistochemistry	3,129	0.5
88361	Morphometric analysis, tumor immunohistochemistry (e.g. HER2/neu)	2,814	0.4
88377	Morphometric analysis, in situ hybridization	2,077	0.3
81455	Genomic seq panel 51 or more genes	2,029	0.3
81445	Targeted genomic seq panel 5-50 genes	1,606	0.3
0037U	Proprietary DNA analysis of 324 genes	1,371	0.2
81210	BRAF gene analysis V600E variant	825	0.1
81538	Oncology lung MS 8-protein signature	776	0.1
88374	Morphometric analysis, in situ hybridization	761	0.1
81403	Molecular pathology procedure level 4	759	0.1
0242U	Proprietary DNA analysis of 55-74 genes	504	0.1
81275	KRAS gene analysis variants in codons 12, 13	468	0.1
0239U	Proprietary DNA analysis of 311 or more genes	447	0.1
81599	Unlisted multianalyte assay algorithmic analysis	294	<0.1
81406	Molecular path proc level 7 (analysis genetic seq)	240	<0.1

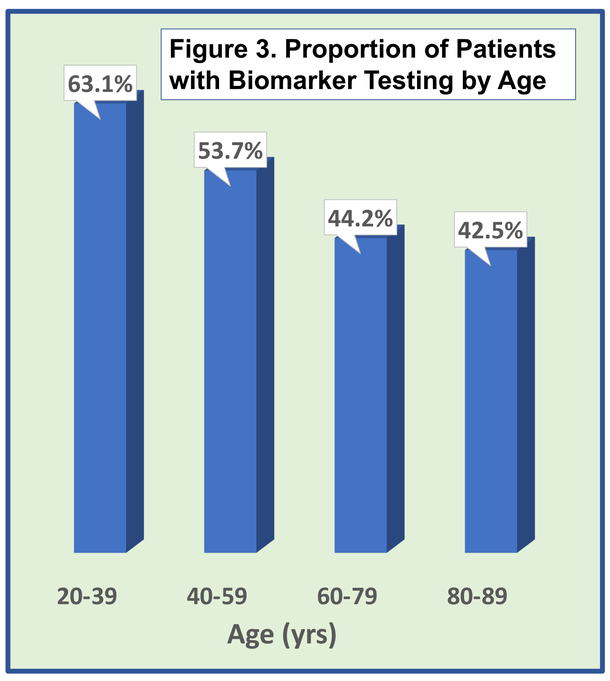
- Most biomarker tests were for immunohistochemistry.
- Use of sequencing panels (e.g., 81455, 81445) was rare.



- Of patients **diagnosed with lung cancer**, only 56.6% of patients with commercial insurance received biomarker testing, and fewer with other insurance types.

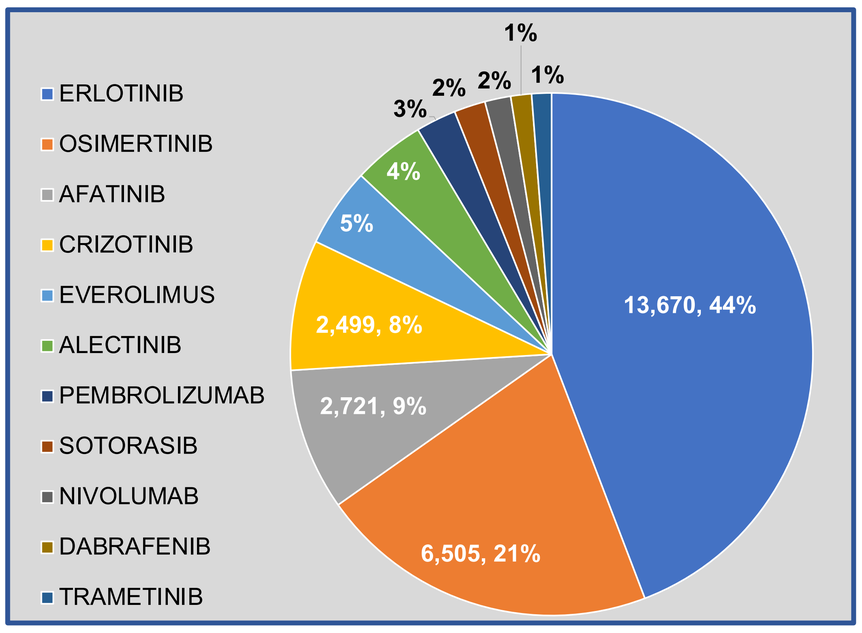


- Of patients **diagnosed with lung cancer**, younger patients were more likely to receive biomarker testing.



- **Targeted therapy use** among biomarker tested patients was 5.2% vs. 3.6% among untested patients (data not shown).
- The **mean comorbidity score** for patients with biomarker testing was 2.96 (SD 2.92) vs. 2.87 (SD 2.90) among untested patients (data not shown).

Figure 4. Initial Targeted Therapy in Biomarker Tested Patients



CONCLUSIONS

- Biomarker testing and receipt of targeted therapy remain low among those diagnosed with lung cancer
- Biomarker testing rates are relatively stable over time but decrease with patient age and are most common among those with commercial insurance
- Addressing low and disparate biomarker testing rates is essential to ensuring appropriate therapy for patients diagnosed with lung cancer

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