

**Robert Wood Johnson  
University Hospital  
Hamilton**

**RWJBarnabas  
HEALTH**

# **REVIEW OF LUNG CANCER DIAGNOSIS & THERAPY**

CoC Std. 4.6

## Introduction

Lung Cancer remains leading cause of cancer death in both men and women in the US and in Mercer County. Based on American Cancer Society’s report, annually approximately 225,000 new diagnosis and more than 157,000 deaths are attributed to lung cancer.

Most patients (56%) of patients are diagnosed at stage 4, or metastatic disease and the median survival for patients with metastatic disease in clinical trials is approximately 15 months. This has led to only 15.6% of patient surviving up to 5 years for all stages of cancer.

In Mercer County, annually approximately 265 new diagnosis and more than 160 deaths are attributed to lung cancer. This compares to 270 new breast cancer diagnosis and 57 deaths annually from breast cancer.

With these data in mind, we set out to understand the care paradigm at Robert Wood Johnson Univeristy Hospital at Hamilton (RWJUH Hamilton) and to try to change the trajectory of the cancer in keeping with efforts across the state and nation.

In this report, we highlight the data from our tumor registry from 2011 thru 2013 and highlight instituion of the lung cancer screening program to change the trajectory of the lung cancer survival. We hope that in 2019, when we revisit the data, we will have seen a change in the survival and outcomes of patients with lung cancer in Mercer County.

## Demographics

Lung cancer remains the disease of elderly. Historically, it was disesease of men, but as shown below Table 1, at our instituion we see that men and women both are affected. Median age of diagnosis (not shown here) is in 70s. This is one of the challenges in outcomes for lung cancer. Being a diseases of the elderly, many times, patients are not candidates for curative and palliative therapies.

*Table 1: Demographics of Lung Cancer (Non-Small cell Lung Cancer) Diagnosis at RWJUH Hamilton 2011-2013*

Year	Total Lung Cancer	NSCLC	Male/Female	Stage 1	Stage 2	Stage 3	Stage 4
2011	111	92	40/52	11	15	20	37
2012	80	67	34/33	6	5	11	34
2013	79	62	36/26	5	4	15	36
Total for 2011-2013	270	221 (81%)	110/111	22 (10%)	24 (11%)	46 (21%)	107 (48%)

*Table 2: Demographics - Age at diagnosis*

	40-49	50-59	60-69	70-79	Greater than 80
2011	3	12	23	29	25
2012	0	8	19	19	21
2013	3	9	18	20	12
<b>Total</b>	<b>6</b>	<b>29</b>	<b>60</b>	<b>68</b>	<b>58</b>

Compared to the national data, where stage 1 cancer accounts for approximately 15% of new diagnosis, at our institution, it accounts for approximately 10% of non-small cell lung cancer. Stage 4, or metastatic lung cancer accounts for almost half of new cancer diagnosis in line with national trends.

Table 3: First Course Therapy for Non-Small Cell Lung Cancer 2011-2013

	Stage 1	Stage 2	Stage 3	Stage 4
Surgery	2013 (3/5) 2012 (4/6) 2011 (4/11)	2013 (1/4) 2012 (2/5) 2011 (4/15)	2013 (2/15) 2012 (2/11) 2011 (2/20)	
Radiation	2012 (1/6) 2011 (5/11)	2011 (3/15)	2013 (2/15)	2013 (8/36) 2012 (7/34) 2011 (10/37)
Chemotherapy	2011 (1/11)	2013 (1/4) 2012 (1/5) 2011 (1/15)	2013 (2/15) 2012 (1/11) 2011 (1/20)	2013 (17/36) 2012 (20/34) 2011 (13/37)
Diagnosis only	2013 (1/5) 2012 (1/6)	2012 (1/5) 2011 (3/15)	2013 (3/15) 2012 (4/11)	2013 (12/36) 2012 (11/34) 2011 (2/37)
ChemoRT	2013 (1/5)	2013 (2/4) 2012 (1/5) 2011 (3/15)	2013 (6/15) 2012 (4/11) 2011 (10/20)	

### First Course of Therapy

As expected, earlier stage cancer patients had more local therapies and late stage patients had more palliative therapies. Approximately 50% of new stage 1 NSCLC patients were treated with surgery, 6 chose radiation therapy only. For stage 4 patient, as expected no patients underwent surgery; while more than (50/107) 46% of patients underwent chemotherapy. Significant number of patients (25 of 107) underwent palliative care only (no therapy after diagnosis).

For stage 3 cancer patients, where standard of care is multidisciplinary (either surgery followed by systemic therapy or chemo-radiation), 20/46 underwent chemoRT and 6 underwent surgery while 7 chose no therapy at all.

Interestingly, 1 patient with stage 1 underwent chemotherapy, while 3 patients out of 24 underwent systemic therapy for stage 2 cancer.

### Metastatic Disease and EGFR status

This study addresses the Standard 4.6 of Commission on Cancer. We chose to evaluate Non Small Cell Lung Cancer as the site for the **year 2012**, and addressed evaluation and therapy for specific target (EGFR or endothelial growth factor receptor mutation). National guidelines (NCCN and ASCO) recommend testing for EGFR in specific set of patients. NCCN recommends evaluation of EGFR for those patients with Non Small Cell Lung Cancer : Adenocarcinoma, Large cell, NSCLC NOS.

ASCO's Provisional Opinion (Beasley, 2011) reports that in community setting, where reflex testing is not routine, process requires coordination across oncologist, pathologist and potentially interventional

physicians. In patients with metastatic disease, our goal is palliation of symptoms. Therapy choices include: Hospice Care, Chemotherapy or Targeted therapies such as Erlotinib. Patients with EGFR mutations should preferentially receive Erlotinib as first line therapy.

In this study we report how many eligible patients had the testing performed. If not performed, we reviewed charts to understand whether it was due to lack of sample, clinically not indicated (patient chose hospice). We hope to use this data to change our practice when appropriate. We chose this topic as we had identified potential process issues in ensuing optimal patient care during our cancer conferences.

#### Methods:

We used registry data to identify eligible patients with search of 2011 dataset for patients with stage 4, non small cell lung cancer with histology: Adenocarcinoma, mixed adeno and squamous carcinoma, large cell carcinoma, bronchioalveolar carcinoma and NOS.

We then reviewed our pathology database and charts to review EGFR testing and results. When EGFR testing was not performed, we used chart review to assess the rationale for not having the data (not ordered by oncologists, not able to be performed due to sampling).

#### RESULTS:

There were 28 patients identified meeting eligibility described above. Chart review, pathology review shows following:

Number of patients	EGFR Y/N	Rationale if No
12	Performed	
10	No	Hospice and pall chosen
2	No	Not able to be performed (ordered)
4	No	Unclear reasons

#### Discussion

Based on the data review, we recognize that we have higher rates of late diagnosis (metastatic disease) which leads to poorer outcomes. With that in mind, we are planning to work on lung cancer screening program to detect lung cancer earlier in high risk populations.

When evaluating data for EGFR mutation, it appears that most of our patients with metastatic disease, who were eligible for therapy, were considered to have EGFR mutation performed. Only 4 patients out of total 28, we were not able to confirm rationale for not having EGFR mutation. For 2 patients, eGFR mutation was ordered, but inadequate sampling precluded evaluation. 10 patients were too ill to have therapy benefits and hospice and palliative care was recommended. While 12 patients did have EGFR mutation analysis and 2 of those patients had positive mutation analysis (total 2/28 or approximately 7%).

**Recommendations:**

We found that for at most 6 patients of eligible 28 patients (2 patients with inadequate sampling, 4 patients with unable to confirm), EGFR evaluation was not done or could not be done. In discussion with pathology department, it appears that when testing is ordered from Oncologists' office, the pathology report is not amended to reflect testing results. To better collect data, we will discuss insittuion of policy to have all pathology request be routed thru pathology department.

## REFERENCES:

American Cancer Society

Beasley MB, Milton, D., Journal of Onc Practice: May 2011, Vol 7; No 3 p 202-204

NCCN Guidelines *Non Small Lung Cancer 2012*