



**WAYNE  
MEMORIAL  
HOSPITAL**

**CANCER COMMITTEE REPORT  
2010**

Cancer Registry  
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The Cancer Registry functions under the supervision of the Cancer Committee and follows the mandated guidelines of the Pennsylvania Cancer Registry and the American College of Surgeons Commission on Cancer.

The Cancer Registry has a reference date of January 1, 2003. To date, 2,131 cancer cases have been accessioned into the Registry database. Currently, we have a follow-up rate of 93 percent, which surpasses the requirement of 80 percent. Accurate follow-up is essential to evaluate cancer care outcomes.

The Cancer Registry accessioned a total of 195 cancer cases in 2009. Of those, 142 were analytic, meaning they were diagnosed and/or received a first course of treatment at Wayne Memorial Hospital. The registry collects demographics, cancer identification, treatment and follow-up data on each eligible cancer patient. This data contributes to treatment planning, staging and continuity of care for cancer patients. Accurate and complete registry data allows for an optimal cancer program. All patients who are diagnosed or treated as an inpatient or outpatient at Wayne Memorial Hospital are included in the registry.

Quality control of cancer registry data is required on 10 percent of all analytic cases per year. The Cancer Committee performed Quality Assurance on 18 analytic cancer cases in 2009 with a 100 percent accuracy rate.

The registry is located in the Medical Record Department and is staffed by a Certified Tumor Registrar from the Regional Cancer Registry at the Northeast Regional Cancer Institute.

## CANCER COMMITTEE CHAIRPERSON REPORT, 2010

The Cancer Program was instituted as part of Wayne Memorial Hospital's (WMH) commitment to the community it serves. In 2009 the members of the Cancer Committee continued to demonstrate their resolve to work toward the prevention, early detection and treatment of cancer. This report represents an overview of the activities of the Cancer Committee during this year.

Since the Cancer Program at WMH is accredited by the Commission on Cancer (CoC) it must be compliant with CoC's standards. In 2009 the Cancer Program was evaluated by this commission and subsequently received "accreditation with commendation". This accomplishment was possible thanks to the united efforts of the members of the Cancer Committee and the Cancer Registry of the Northeast Regional Cancer Institute (NRCI).

The tumor (conference) board continued to prospectively review all new cancer cases diagnosed at WMH. Medical oncology, surgery, radiology and pathology participated in these reviews and encourage members of the medical staff to attend the board's luncheon meetings held each Tuesday (except the fourth Tuesday) of the month.

Participation by these specialties was almost 100%. Additionally, as part of its ongoing quality improvement efforts, all reviews now include AJCC stage, prognostic indicators and NCCN guidelines in its treatment planning recommendations.

Quality improvement goals achieved in 2009 include assurances that:

1. Stage III colon cancer patients obtain an oncology consult and adjuvant therapy is recommended.
2. Breast cancer patients consider or receive chemotherapy according to NCCN guidelines.
3. Breast cancer patients under the age of 70 who have had breast conservation surgery consider or receive radiation therapy.

As part of its ongoing quality improvement goals, the Cancer Committee will continue to monitor the use of NCCN guidelines in the "initial work up" of breast and colorectal cancer and the administration of Herceptin for Her-2-Neu positive breast cancer.

Oncology services in this year underwent changes in physician coverage. In May, Dr. Readling agreed to cover hematology/oncology services until Dr. Choudry joined the medical staff as a full-time hematologist/oncologist. Their addition to the hospital staff and their participation on the Cancer Committee at a time of change permitted continued and uninterrupted service to cancer patients in our area.

WMH's Community Outreach continued to actively address prevention and early detection of cancer. In addition it has partnered with NRCI to provide programs such as the "Sun Safety", Breast Cancer Community Education, ACT and Health Care Professional Programs. Well received educational programs dealing with lung cancer and AJCC staging were also provided this year.

Of the 195 cancer cases diagnosed at WMH in 2009, the majority of cases involved the digestive system, the respiratory system and the breast. This data reinforces the need for updated and informative educational programs dealing with breast, colorectal and lung cancer. In keeping with this concept, the following article compares statistical data collected for WMH with the National Cancer Database (NCDB) dealing with non-small cell lung cancer (NSCLC) and reviews the movement toward the development of personalized therapy for this group of cancer patients.

Respectfully submitted,

Lillian Longendorfer D.O.  
Chairperson, Cancer Committee

## NON-SMALL CELL LUNG CANCER: An Overview of Molecular Predictive Markers for Targeted Therapy By Lillian Longendorfer, D.O.

Non-small cell lung cancer (NSCLC) is a recognized leading cause of cancer deaths in the United States. Thus, it is not surprising that this form of lung cancer is a concern for Wayne Memorial Hospital's (WMH) Cancer Program and the community it serves.

Despite efforts to alert the community regarding tobacco cessation and to provide educational programs focused on the detection of lung cancer, tumor stage at the time of diagnosis remains high. At WMH most cases of NSCLC (45%) continue to be stage IV when diagnosed. In fact, the number of cases diagnosed at each stage remains essentially unchanged from the last review of this topic in the 2008 Annual Report. (Figure 1).

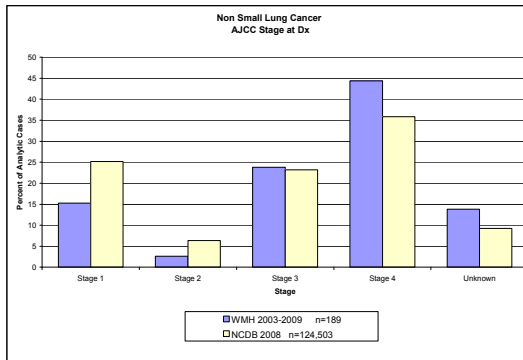


Figure 1

The age at which lung cancer is diagnosed at WMH continues to be in the older age groups (60-80+ years) with the majority of patients (38%) being between 70 and 79 years of age (Figure 2). This data also remains essentially unchanged from the 2008 data.

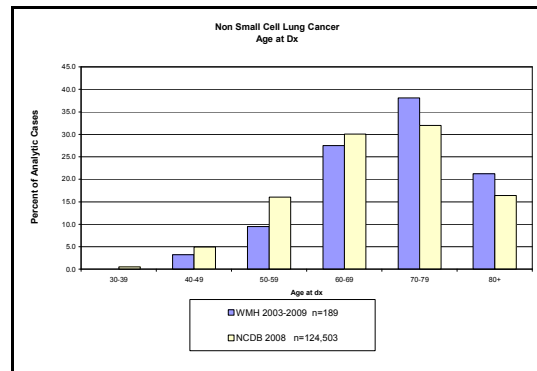
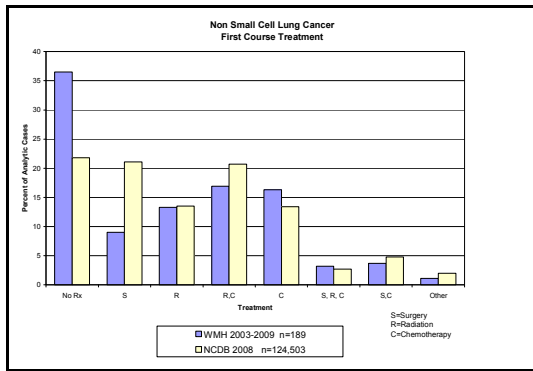


Figure 2

The number of lung cancer patients receiving no treatment following diagnosis continues to be high at WMH when compared with the NCDB (37% vs. 22%) (Figure 3). Again, when this data is compared with 2008 data the percent of patients receiving some form of treatment or no treatment remains essentially unchanged. This is disappointing data in light of community educational programs provided by WMH that addressed treatment options and availability locally. In addition and because of the low number of cases encountered at WMH calculations concerning survival would be inappropriate at this time.



The lack of significant improvement in the age at which NSCLC is diagnosed, the stage at which it is diagnosed and the number of patients electing some form of therapy reinforces the need for continued community education. As noted in Dr. McVeigh's 2008 report on NSCLC, there are a number of obstacles to overcome including fear of the diagnosis itself, fear of the toxic effects of available therapeutic modalities and their possible failure. With the advent of molecular biologic methods, treatment modalities for NSCLC are beginning to transition from a non-personalized approach to a personalized approach which may improve outcomes. What follows is an overview of the emerging personalized approach to NSCLC therapy for patients with early-stage, unresectable, locally advanced or metastatic disease.

Depending on the patient's medical status and stage of disease treatment options include surgery, radiation therapy and/or chemotherapy. Surgery remains the primary curative treatment for early-stage disease. Yet, despite successful resection, the 5 year survival rate ranges from 31% for stage IIB to 77% for stage IA disease. But, for patients with advance-stage disease treated with systemic cytotoxic chemotherapy, long term survival is less than 2%.

Molecular targeted therapy promises higher efficacy and less toxicity. The

objective of personalized therapy is to genomically identify patients at risk of illness and provide the right drug and dose of drug at the right time. Targeted therapies based on genetic alterations in the tumor are appropriate for selected cases. Identifying mutations in oncogenes associated with NSCLC can distinguish those patients most likely to benefit from targeted therapy from those who would not. Such oncogene include EGFR, KRAS and ALK.

When activated by ligand binding, epidermal growth factor receptor (EGFR) protein stimulates protein tyrosine kinase activation of the signaling pathways associated with cell growth and survival. Over-expression of and activating mutations in the tyrosine domain of the EGFR gene leads to tumor growth and progression. Thus EGFR has become a target for anti-cancer drug therapy. Drugs such as *erlotinib* and *gefitinib* are EGFR tyrosine kinase inhibitors (TKIs) that prevent activation of the signaling pathways and improve survival in selected patients with NSCLC.

Testing for EGFR mutations is an effective way of predicting which patients might benefit from TKIs. The most common mutations associated with sensitivity to EGFR TKIs include exon 19 deletions, L858R, L861Q and G719A/C/S. These mutations are associated with response rates of > 70% in patients with either *erlotinib* or *gefitinib*.

The KRAS gene encodes the KRAS protein which stimulates signaling pathways downstream from EGFR. KRAS mutations cause mutated KRAS protein that continually stimulates these downstream proteins. Even though EGFR TKIs can block EGFR activation, they cannot block the activity of the mutated KRAS protein. Therefore, KRAS mutations tend to be resistant to *erlotinib* and *gefitinib*. KRAS mutations are prognostic for poor survival independent of therapy.

Oncogene rearrangements of the anaplastic lymphoma kinase (ALK) gene have recently been described in NSCLC. A recent Phase I study indicates that ALK possibly represents a new therapeutic target in a molecularly defined subset of NSCLC. ALK is an oncogene activated not by mutation but by fusion with another gene (the fusion of the 5' end of EML4 gene and the 3' end of the ALK gene). EML4-ALK is the most common 2p23 rearrangement associated with the ALK gene. Patients with ALK rearrangements are younger than most patients with NSCLC. EML4-ALK and other 2p23 fusion products lead to the production of an activated kinase likely to be sensitive to ALK inhibitors that are effective against ALK rearranged lung tumor and cell lines. In this Phase I trial, NSCLC with ALK rearrangements respond to *crizatinib* (Pfizer) treatment. Phase II and III clinical trials are underway. Patients who have ALK rearrangements do not benefit from treatment with the EGFR-specific TKIs and may be considered for ALK-targeted clinical trials.

Interestingly, EGFR, KRAS and ALK mutations are almost always mutually exclusive (i.e. only 1 of these 3 genes occurs within a tumor). Thus, only molecular testing definitively identifies

the mutations associated with targeted therapy response or resistance.

The evaluation of EGFR and KRAS mutations has become integrated into the diagnostic work up of NSCLC (i.e. NCCN guidelines). It is predicted that ALK analysis will as well. The field of targeted therapy in NSCLC is expanding. Other oncogenes including BRAF, PIK3CA and Her2 are currently being evaluated as potential diagnostic classifiers and therapeutic targets also.