

Mercy Health – Mt. Airy Hospital
Annual Report on 2010 Activities
Non-Hodgkin Lymphoma
Outcomes Study

Cancer Program Summary

The Mercy Health - Mt. Airy Hospital Cancer Program has maintained approval by the American College of Surgeons since the early 1980's. We have earned the Outstanding Achievement Award for our Cancer Program. In addition to a wide range of diagnostic and treatment services, our hospital offers many programs to provide assistance to both our patients and their families as they cope with a diagnosis of cancer. Our support services include nutritional support, spiritual support, rehabilitation, palliative care, educational programs for our patients and the community, information on access to clinical trials and cancer support groups and programs, many of which are provided through participation with the American Cancer Society.

To meet the growing and changing needs of the patients and the communities we serve, our Cancer Committee continually strives for Cancer Program excellence by annually reviewing our services, performing patient care studies, and by setting annual goals to improve and enhance our services.

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Mercy Health - Mt. Airy Hospital implemented many patient care improvements, sponsored a large number of patient, community and staff educational offerings and increased our services last year. These included:

- The acquisition and implementation of innovative diagnostic instrumentation such as the gamma probe for use in sentinel node biopsies and state-of-the-art ultrasound instrumentation for breast biopsies
- The addition of a palliative care team to meet the mind, body and spiritual needs of our patients
- The completion of a pain management education series for our nursing staff

Cancer Conferences

Cancer conferences provide a format for multidisciplinary involvement in the planning of care for cancer patients and are an important part of our cancer program. They are integral to improving the care of cancer patients and provide education to physicians and hospital staff. Patient identities are kept confidential.

All specialties are invited to attend and physicians from Medical Oncology, Radiation Oncology, Diagnostic Radiology, Pathology, and General Surgery specialties are present to discuss treatment options for the types of cancers presented at the conferences. Treatment based on national guidelines and prognostic indicators, including AJCC stage, is the focus of discussions.

Cancer Registry

The National Cancer Registrars Association provides the following description of the work that Cancer Registrars perform, “Cancer registrars capture a complete summary of the patient’s disease from diagnosis through their lifetime.” The information is not limited to the episodic information contained in the health care facility record. The summary or abstract is an ongoing account of the cancer patient’s history, diagnosis, treatment, and current status.

The cancer programs at Mercy Health make accurate data collection a priority. Cancer Registrar certification (CTR) is required and is maintained by continuing education in cancer data collection standards, cancer program requirements and in the diagnosis and treatment of cancer.

Cancer Committee

The Cancer Committee, a multi-disciplinary team of hospital employees, staff physicians and members from the American Cancer Society, meets quarterly to direct the activities of the Cancer Program by monitoring our performance, reviewing our available services and programs and determining what enhancements are needed to meet the needs of our cancer patients.

Our mission is to ensure that our patients, their families and our communities have access to a full range of medical services, supportive programs and services and community outreach activities that impact quality of life and survival. Our focus is on prevention, screening and early detection programs and quality of life services.

Mercy Health - Mt. Airy Hospital 2010-2011 Cancer Committee Membership

Physician Members

Daniel White, MD - Chair, Radiation Oncology
James Maher, MD - Medical Oncology, Cancer Liaison
Lawrence Bartish, MD - General Surgery
Victor Cabanas, MD - Pathology
Scott Welton, MD - Diagnostic Radiology

Cancer Program Coordinators

Daniel White, MD - Quality of Registry Data
Victor Cabanas, MD - Cancer Conference
Alice Wanninger - Community Outreach
Nancy Moran, RN, BSN - Quality Improvement

Allied Health Members

Denise Kimmich, RN, BSN, - Nursing
Rob Brown, BS, RVT - Manager, Imaging Services
Elaine Wiseman - Cancer Registry
Nancy Moran, RN, BSN - Quality
Christine Kirby, PharmD - Pharmacy
Heleena McKinney, MEd - American Cancer Society
Mary Ellen Kreutzer, RN, BSN - Palliative Care
Sherry Rudd, RN, BSN, CRRN - Rehabilitation
Cynthia Work, RN -Case Management
Andrea Thaman, - Social Work
Susan Mackall, MA - Chaplain, Spiritual Care
Debbie Epperson, RHIA - Cancer Program Administrator

2010 Cancer Data Summary and Comparisons

Top Cancer Sites by Sex in 2010

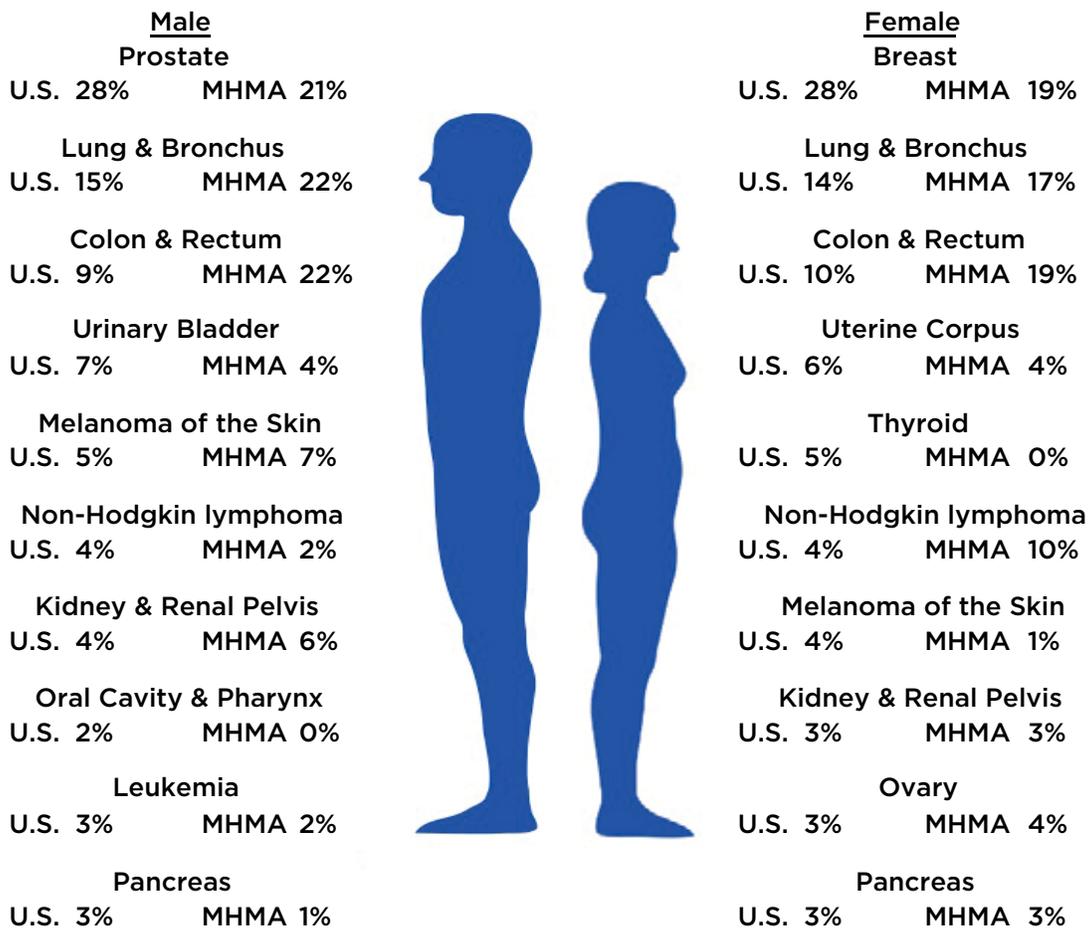
The 5 most frequently seen cancer sites for men at Mercy Health – Mt. Airy Hospital in 2010 were lung/bronchus (22%), colorectal (22%), prostate (21%), melanoma of the skin (7%), and kidney/renal pelvis (6%).

For females, the top 5 sites in 2010 at Mercy Health – Mt. Airy Hospital were breast (19%), colorectal (19%), lung/bronchus (17%), non-Hodgkin lymphoma (10%), and corpus uteri/ovary (4% each).

Compared with the estimated 2010 national data, distribution of our sites by gender revealed a similar comparison to the U. S., for most of the sites shown in the table below. However, we see fewer breast and prostate cancers at our hospital and more lung and colorectal cancer cases for both male and female patients than the national incidence.

These differences are not felt to be reflective of the true incidence of these cancers in our community, but rather a reflection of the types of services available at our facility. Our breast and prostate cancer patients who are candidates for adjuvant chemotherapy and/or radiation are referred to local oncologists for treatment at cancer treatment centers or other hospitals in the area.

2010 Top Cancer Sites by Sex Mercy Health - Mt. Airy Hospital



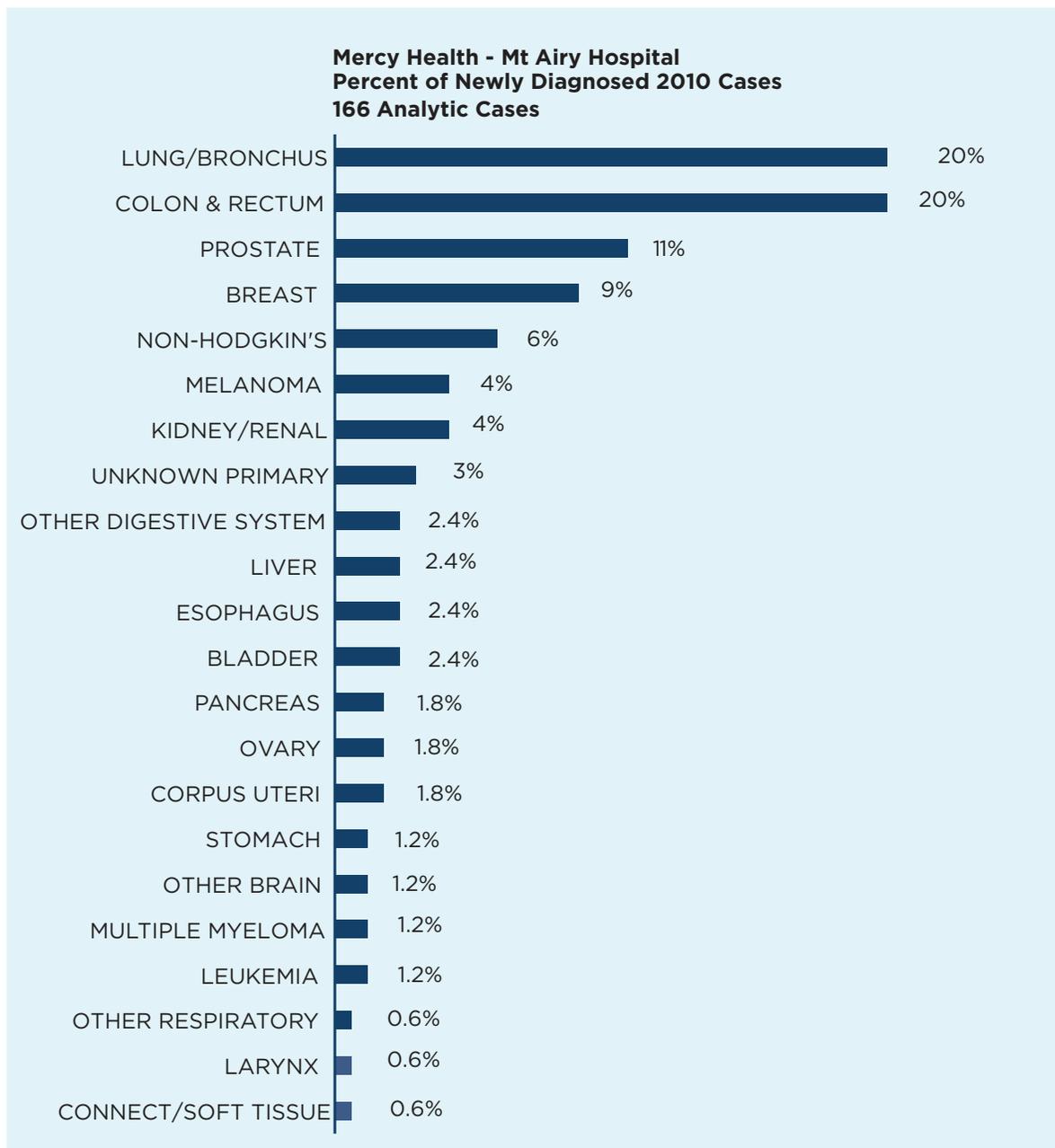
American Cancer Society Inc., Surveillance and Health Policy Research, Facts and Figures, 2010
U.S. figures are estimated for 2010

Distribution of 2010 Cancer Sites

The total number of cases in the Mercy Health - Mt. Airy Hospital Cancer Registry database since the 2003 reference date is 2,392 cases. 2,228 of these cases are available for analytic studies.

During 2010, a total of 187 cases were accessioned into the registry database, 166 analytic (newly diagnosed) cases and 21 non-analytic (recurrent cancer) cases. The statistics contained in this report represent only analytic cancer cases.

The top five sites at Mercy Health - Mt. Airy Hospital in 2010 were lung/bronchus, colorectal, prostate, breast, and non-Hodgkin lymphoma.



Outcome Study - Non-Hodgkin Lymphoma

Non-Hodgkin lymphoma (NHL) is a group of more than 20 types of cancers that originate in the lymphocytes (a type of white blood cell) or lymph system. The lymphatic system is part of the immune system. The lymphatic system includes lymph vessels, lymph fluid, lymph nodes, tonsils, thymus and spleen. Usually lymphoma is first found in a lymph node. Non-Hodgkin lymphoma can occur at any age, although it is most commonly diagnosed in the elderly. The different types of non-Hodgkin lymphoma are grouped based on the type of lymphocyte affected. The two types of lymphocytes that can cause lymphoma are B-cells and T-cells. The most common types of lymphoma are diffuse large B-cell and follicular. For treatment and prognostic purposes, non-Hodgkin lymphomas are divided into two groups, aggressive (fast growing) and indolent (slow growing).

NHL Incidence and Mortality in the United States

Incidence - Non-Hodgkin lymphoma is the 6th most common cancer in the United States. The American Cancer Society (ACS) estimates 65,540 new cases of non-Hodgkin lymphoma will be diagnosed in 2010. Studies show that 1 in 44 men and 1 in 52 women will be diagnosed with non-Hodgkin lymphoma during their lifetime. Overall incidence has been stable since 1991 in men but has been increasing by a little over 1% per year in women since 1990. 56% of our NHL cases were male and 44% female.

Mortality - Non-Hodgkin lymphoma is the sixth highest cause of cancer deaths in American women and the eighth most common cause of cancer deaths in American men. The ACS estimates 20,210 non-Hodgkin lymphoma deaths in 2010. Death rates for NHL increased during most of the past 2 decades but have been decreasing by about 3% - 4% since 1997.

Signs and Symptoms

Symptoms include: swollen painless lymph nodes, unexplained weight loss, fever, night sweats, itchy skin, coughing or trouble breathing, along with overall weakness and tiredness.

Risk Factors

Risk factors for non-Hodgkin lymphoma include:

- Weakened immune system
- Infections including:
 - Human immunodeficiency virus (HIV)
 - Epstein-Barr virus (EBV)
 - Helicobacter pylori, H. pylori
 - Human T-cell leukemia/lymphoma virus (HTLV-1)
 - Hepatitis C virus
- Age

Most cases of non-Hodgkin lymphoma occur in people over the age of 60

Researchers are now studying the effects of obesity and work with herbicides to see if these factors increase the risk of non-Hodgkin lymphoma.

Diagnostic Methods

Swollen lymph nodes are the most common symptom. A physical exam is completed along with a complete blood count. Biopsy of an enlarged node is completed for tissue diagnosis.

Factors that Determine Treatment and Prognosis

Histology – Histology refers to the microscopic structure of the tissue in the tumor. There are more than 20 different types of lymphomas and although all are cancers of the lymphocytes, they each behave differently and have different treatment options and outcomes.

According to data in the National Cancer Data Base, 33% of the non-Hodgkin lymphomas in CoC-approved cancer programs were large B-cell diffuse lymphomas with 27% follicular types.

Findings: Our histologic types differed from those seen nationally with a higher percentage of Small B-cell Lymphocytic Lymphoma. Additionally, we had only one case of Non-Hodgkin, NOS seen at our hospital but this is a histology term that is obsolete and so no longer documented by our hospital as such.

Age – Age at diagnosis is an important prognostic indicator. Most non-Hodgkin lymphomas are diagnosed after age 60 when significant and debilitating comorbidities may affect the patient’s overall health and ability to withstand the rigors of treatment such as chemotherapy. If a patient cannot be optimally treated, survival and quality of life may be dramatically affected.

Findings: Most of our patients were diagnosed after age 60 which is similar to what is seen nationally.

Blood test results: The serum lactate dehydrogenase (LDH) is an indicator of how much disease there is in the body. The higher the level of LDH, the more disease is present. Those with a lower level of LDH at diagnosis will do better than those with a high level.

Non-Hodgkin Lymphoma - nodal Diagnosed 2003 - 2008

Lymphoma Histology	U.S.	MHMA
	%	%
Large B-Cell Diffuse, NOS	33%	35%
Follicular, NOS	11%	15%
Non-Hodgkin, NOS	10%	0%
Other Specified Types	9%	8%
Small B Lymphocytic, NOS	8%	20%
Follicular Grade 1	7%	5%
Malignant Lymphoma, NOS	5%	4%
Follicular Grade 2	5%	1%
Mantle Cell	4%	3%
Follicular Grade 3	4%	4%
Marginal Zone B-Cell	4%	5%

Performance status: This is a measurement of how fit and self-sufficient the patient is and whether or not symptoms are present. As with other cancers, patients who are otherwise healthy and fit will do better than those who are weakened or sick. The presence of one or more symptoms, called B-symptoms, (fever for 3 or more days, weight loss exceeding 10% of body weight within 6 months, and drenching night sweats) indicates that the disease may be in more parts of the body than can be identified by the usual tests.

Stage - Stage at diagnosis is an important tool used to plan treatment and predict prognosis. Staging must be completed to determine the extent of the disease. Bone marrow biopsy is completed along with CT scans, MRI scans and PET CT scans to aid in staging.

The AJCC cancer staging schema for lymphoid neoplasms differs from the TNM schemas for other primary sites. Extent of disease is based on the number of lymph node regions involved and whether other sites, such as the spleen, are involved. Stages range from stage 1 (localized) through stage 4 (diffuse or disseminated, including bone marrow involvement). If the lymphoma involves organs outside the lymph system, such as liver, brain or spine, treatment is usually not as successful.

Stage at Diagnosis Comparison

Findings: We had more stage 1, stage 2 and stage 3 cases than seen nationally but our sample size may be too small to make an accurate comparison.

Treatment Modalities

Treatment is based on many factors, including stage of disease, non-Hodgkin lymphoma histology, patient age and other comorbidities at the time of diagnosis.

Watchful Waiting

If lymphoma is a slow growing (indolent) watchful waiting or active surveillance may be recommended. Patients are closely monitored on a regular basis. No treatment will be given in these cases until symptoms arise.

Chemotherapy

Chemotherapy is the most common form of treatment for non-Hodgkin lymphoma. Two type of drug agents are typically used: alkylating agents (cytotoxic agents that inhibit the cell division by reacting with DNA), and nucleosides (agents that inhibit DNA and RNA replication and prevent cancer cells from growing).

Single drug treatments may be given for indolent NHL, while combination treatments are given for aggressive types or recurring NHL. Examples of chemotherapy agents given singly include Fludaribine, Cladribine, Chlorambucil, and Cyclophosphamide. The combination drugs used frequently include Cyclophosphamide, Hydroxdaunomycin, Vincristine and Prednisone known as CHOP, Cyclophosphamide, Vincristine and Prednisone known as CVP, and Bleomycin, Doxorubicin, Cyclophosphamide, and Vincristine known as BACOD. These regimens may also include the monoclonal antibody Rituximab.

Radiation Therapy

External beam radiation therapy, alone or in combination with chemotherapy, is used less often but can be used for early stage lymphoma to treat a single lymph node chain. Radiation treatments can be given for residual tumor after chemotherapy regimen is completed.

Immunotherapy

Immunotherapy is a process in which the immune system is enhanced, induced or suppressed to maximize the body's ability remove disease on its own. Monoclonal antibodies work on cancer cells similar to the way natural antibodies work by identifying and binding to the target cells. The most common immunotherapies for NHL are Rituximab (Rituxan) and AleMt.uzumab (Campath). These drugs are given for initial treatment and recurrence of some types of NHL.

Radioimmunotherapy combines radiotherapy with monoclonal antibody therapy. Zevalin® has been approved by the FDA as a first-line radioummunotherapy treatment for certain types of follicular lymphomas.

Interferons are proteins that help strengthen the immune system and are given alone or along with chemotherapy.

Bone Marrow Transplants

In some cases, a bone marrow or stem cell transplant may offer the best chance for long term survival. There are two types of tranplants, (autologous transplant), which uses blood-forming cells collected from the patient and (allogeneic transplant), which uses blood forming cells from a family member or unrelated donor. The goal of a transplant is to destroy cancer cells in marrow, blood, and other parts of the body and then replace the blood stem cells to create healthy bone marrow. Patients receive high dose chemotherapy and or radiation therapy to destroy bone marrow and suppress the immune system before transplant.

Stem Cell Transplant

In this type of autologous transplant, the patient's blood is passed through a machine that removes the stem cells (immature cells from which all blood cells develop). This process is called apheresis and is completed over three to four days. The patient then receives treatment to kill any cancer cells and the stem cells are frozen until they are transplanted back into the patient.

Treatment Comparison to National Cancer Database

Findings:

Stage 1 –23% of the cases were treated with chemotherapy alone or in combination with other treatments. 18% had no first course of treatment and there were 15% of the cases that were only treated with surgery.

Stage 2 –41% of the cases were treated with chemotherapy alone or in combination with other treatments. 12% had no first course of treatment and there were no cases that were only treated with surgery.

Stage 3 –90% of the cases were treated with chemotherapy alone or in combination with other treatments. There were 10% of the cases that had no first course of treatment.

Stage 4 –44% of the cases were treated with chemotherapy alone or in combination with other treatments. 14% had no first course of treatment.

Compared to the NCDB all stages except stage 1 had a higher percentage of cases that had some type of treatment which may be explained by the effort that is concerted in obtaining all treatment information.

Non-Hodgkin Lymphoma- Diagnosed 2003 - 2008

Treatment by Stage Comparison

National Cancer Data Base vs Mercy Health – Mt. Airy Hospital

Treatment Type	NCDB	MTA	NCDB	MTA	NCDB	MTA	NCDB	MTA	NCDB	MTA	NCDB	MTA
	Stage 1		Stage 2		Stage 3		Stage 4		Stage N/A		Stage Unknown	
Surgery Only	15%	15%	8%	0%	7%	0%	5%	5%	12%	0%	10%	0%
Surgery and Chemotherapy	6%	0%	8%	0%	10%	0%	7%	0%	7%	0%	7%	0%
Radiation and Chemotherapy	8%	0%	7%	0%	2%	0%	3%	10%	1%	0%	3%	0%
Chemotherapy only	17%	23%	26%	35%	32%	70%	33%	24%	19%	0%	25%	33%
Surgery, Chemotherapy and Hormone	2%	0%	3%	0%	6%	0%	4%	0%	1%	0%	2%	0%
Chemotherapy and Hormone	4%	0%	11%	6%	13%	20%	13%	10%	4%	0%	5%	0%
Other Specified Therapy	29%	38%	23%	47%	14%	0%	16%	38%	8%	0%	16%	0%
No 1st Course Rx	20%	23%	14%	12%	16%	10%	19%	14%	47%	0%	33%	67%
% of Cases for Stage Group	18%	18%	15%	23%	20%	27%	30%	28%	1%	0%	17%	4%

Source: ©2011 National Cancer Data Base (NCDB) / Commission on Cancer (CoC)

Survival

Survival rates vary among the cell types of NHL and the stage at diagnosis. Overall, the one year survival for NHL is 80%, 5 year survival is 67%, and 10 year survival is only 56% according to American Cancer Society statistics.

Survival by Stage

Comparison of Mercy Health - Mt. Airy Hospital to National Survival

Findings: Comparison of survival data for our patients diagnosed in 2003 shows that our survival is higher than national survival, except for stage 4. The number of patients diagnosed at Mercy Health - Mt. Airy Hospital in 2003 was just 14, however, and does not give an adequate sample size for comparison.

National Cancer Database

Non-Hodgkin Lymphoma-nodal
5 Year Survival Diagnosed 2003

	Year				
	1	2	3	4	5
Stage 1	87.6%	82.4%	79.0%	75.4%	72.0%
Stage 2	82.4%	74.9%	71.3%	68.3%	64.9%
Stage 3	78.9%	70.3%	65.9%	61.7%	58.0%
Stage 4	68.9%	60.2%	55.3%	51.0%	47.9%
Overall	77.3%	69.6%	65.3%	61.4%	58.1%

Mercy Health - Mt. Airy Hospital

Non-Hodgkin Lymphoma-nodal
5 Year Survival Diagnosed 2003

	Year				
	1	2	3	4	5
Stage 1	100%	80%	80%	80%	80%
Stage 2	100%	100%	100%	100%	100%
Stage 3	0%	0%	0%	0%	0%
Stage 4	25%	25%	25%	25%	25%
Overall	69%	62%	62%	62%	62%

Summary of Findings and Recommendations:

Histologies: Our histologies show similar percentages of large B-cell diffuse lymphoma, a similar percentage of follicular lymphoma, and much higher small B-cell lymphocytic lymphoma.

Age: Our age distribution compares favorably to what was seen nationally.

Stage: The stage at diagnosis for patients seen at Mercy Health – Mt. Airy Hospital showed a higher incidence of stage 1, 2 and stage 3 disease. We had 1% of cases that were staged unknown compared to 17% nationally.

Survival: Our survival was higher with stages 1 and 2 when compared to the national data. Overall, our survival was nearly the same as the national survival. Again, this was a small population of patients diagnosed in 2003.

Recommendations: Continue to capture all treatment information to reflect the accurate and complete cancer data that can be used for cancer control and epidemiological research, public health program planning, benchmarking, and patient care improvements.

Promote early detection to improve outcomes by providing information at community health fairs.

Increase awareness of clinical trials through access to the Mercy Health – Mt. Airy Hospital Cancer Resource Center to provide information on the latest clinical trials for promising therapies in the treatment of lymphoma.

Present cases for multidisciplinary discussions at cancer conference using the NCCN guidelines for treatment of lymphoma.

Clinical Trials

For information on access to clinical trials in your area:

- Call the American Cancer Society, Clinical Trials Matching Service (a free, confidential program) at 1-800-303-5691 or visit www.cancer.org
- Visit the National Cancer Institute (NCI) website at: www.cancer.gov/clinicaltrials/search
- Visit the Coalition of Cancer Cooperative Groups at: www.cancertrialshelp.org

References

- American Cancer Society, Facts and Figures, 2010
- National Cancer Institute: <http://www.cancer.gov/cancertopics/types/non-hodgkin>
- LymphomaInfo.net: <http://www.lymphomainfo.net/therapy/immunotherapy/index.html>



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