Mercy Health – Anderson Hospital

Annual Report on 2010 Activities

Non-Hodgkin Lymphoma Outcomes Study

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MERCYHEALTH
Anderson Hospital

Cancer Program Summary

The Mercy Health – Anderson Hospital Cancer Program has maintained accreditation by the American College of Surgeons since the early 1980's. We have earned the Outstanding Achievement Award for our Cancer Program since the inception of the award in 2004. In addition to a wide range of diagnostic and treatment services, Mercy Health – Anderson Hospital offers a bevy of 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.

Mercy Health – Anderson Hospital has implemented several patient care improvements, sponsored a large number of patient, community and staff educational offerings, and increased our services last year. These included:

- Developed and promoted "Caregiver Resource Packet" containing caregiver information and support resources for patients/family members/staff that care for others
- Neutropenic patients received antibiotics within benchmarking time frame of 60 minutes after implementation of new order set with national average at 30%-50%
- Promoted public awareness and education regarding Colorectal Cancer prevalence and prevention by sponsoring a Colorectal Awareness Day
- Developed an OB/GYN Oncology clinic

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 essential 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, Thoracic Surgery, Breast Surgery, 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.

Mercy Health – Anderson Hospital 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 – Anderson Hospital | 2010-2011 Cancer Committee Membership

Physician Members
Jeffrey Grass, MD, Chair - Radiation Oncology
K. Ann Weichert, MD, Cancer Liaison - Medical and Radiation Oncology
Cynthia Westermann, MD, Cancer Liaison - Pathology (as of 8-2011)
Sandra Miller, M.D. - Breast Surgery
Wm, Edward Richards, M.D. - GYN Oncology
Peter Ruehlman, M.D. - Medical Oncology
David Ward, M.D. - General and Vascular Surgery
Kevin Weber, M.D.- Imaging
Cynthia Westermann, MD - Pathology

Cancer Program Coordinators
Kathryn Weichert, MD - Quality of Registry Data
Jeff Grass, MD - Quality Improvement
Cynthia Westerman, MD - Cancer Conference (until 8-2011)
Kelly Franer, RN, MSN, CNP (2010) - Outreach Coordinator
Karen Brassfield, RT (until 8-2011) - Outreach Coordinator
Lorieta Garrison (as of 8-2011) - Outreach Coordinator

Allied Health Members
Leslie Altimier, RN, MSN - Nursing
Karen Brassfield, RT (2011)
Bill Carroll, RPh - Pharmacy
Colleen DeHaan, BS, RT (R) (CT) (MR)-Radiology
Neil Fedders, OTR/L - Rehabiltation Services
Kelly Franer, RN, MSN, CNP (2010) - Nursing
Lorieta Garrison (2011)
Debbie Kern - Cancer Survivor (2010)
Heelena McKinney - American Cancer Society
Adam Momper, MHSA - Ambulatory Services (2011)
Laura Metzler - American Cancer Society (2010)
Kay O'Rourke, BCC, M.Ed - Spiritual Care
Beth Shannon, RN - Cancer Survivor (2011)
Kristen Shelley, RN, MSN - Nursing
Karen Smith, RHIA, CTR - Cancer Registry
Lisa Thomas, RN BSN - Case Management/Quality
Mardee White, RN - Palliative Care

2010 Cancer Data Summary and Comparisons

The total number of cases in the Mercy Health – Anderson Hospital Cancer Registry database since the 2003 reference date is 4,936 cases. 4,496 of these cases are available for analytic studies. During 2010, a total of 531 cases were accessioned into the registry database, 484 analytic (newly diagnosed) cases and 47 non-analytic (recurrent cancer) cases. The statistics contained in this report represent only analytic cancer cases.

Top Cancer Sites in 2010

The top five sites at Mercy Health – Anderson Hospital in 2010 were breast, lung/bronchus, colorectal, non-Hodgkin lymphoma, and kidney & renal pelvis.

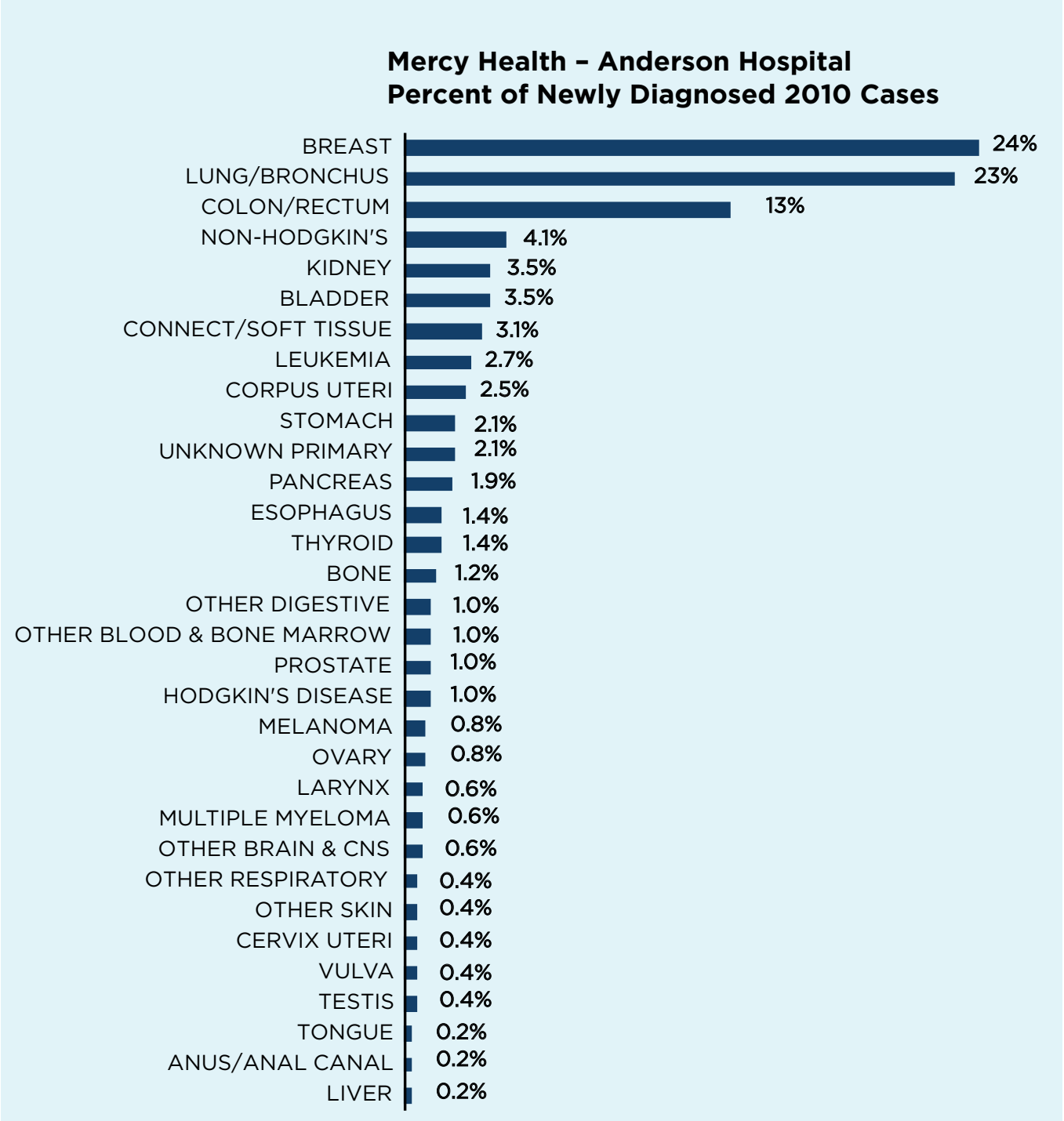
Distribution of our sites by sex revealed we have fewer prostate and uterine cancers and this is likely due to a shift in standard of care due to available technology. These differences are not felt to be reflective of the true incidence of these cancers in our community, but rather a reflection of the types of services available at our facility.

2010 Top Cancer Sites by Sex
Mercy Health – Anderson Hospital

Male			Female		
Prostate	U.S. 28%	MHA 1%	Breast	U.S. 28%	MHA 23%
Lung & Bronchus	U.S. 15%	MHA 11%	Lung & Bronchus	U.S. 14%	MHA 12%
Colon & Rectum	U.S. 9%	MHA 7%	Colon & Rectum	U.S. 10%	MHA 7%
Urinary Bladder	U.S. 7%	MHA 3%	Uterine Corpus	U.S. 6%	MHA 2%
Melanoma of the Skin	U.S. 5%	MHA 1%	Thyroid	U.S. 5%	MHA 1%
Non-Hodgkin lymphoma	U.S. 4%	MHA 2%	Non-Hodgkin lymphoma	U.S. 4%	MHA 2%
Kidney & Renal Pelvis	U.S. 4%	MHA 3%	Melanoma of the Skin	U.S. 4%	MHA 0%
Oral Cavity & Pharynx	U.S. 3%	MHA 1%	Kidney & Renal Pelvis	U.S.	MHA 1%
Leukemia	U.S. 3%	MHA 1%	Ovary	U.S. 3%	MHA 1%
Pancreas	U.S. 3%	MHA 1%	Pancreas	U.S. 3%	MHA 1%

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



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 histology types have a lesser percentage of large B-cell diffuse lymphoma and an increased percentage of follicular lymphoma which could be explained by the lymphoma being diagnosed early before the follicular lymphoma transforms to the large B-cell diffuse histology. Non-Hodgkin, NOS is a histology term that is obsolete and no longer used, which explains our lower percentage.

Age – Age at diagnosis is an important prognostic indicator. Most non-Hodgkin lymphomas are diagnosed after age 60 when significant and debilitating comorbities 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. Our age distribution compared favorably to what was 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.	MHA
	%	%
Large B-Cell Diffuse, NOS	33%	21%
Follicular, NOS	11%	24%
Non-Hodgkin, NOS	10%	2%
Other Specified Types	9%	14%
Small B Lymphocytic, NOS	8%	13%
Follicular Grade 1	7%	7%
Malignant Lymphoma, NOS	5%	5%
Follicular Grade 2	5%	3%
Mantle Cell	4%	4%
Follicular Grade 3	4%	4%
Marginal Zone B-Cell	4%	2%

Source: National Cancer Database

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 2 and stage 3 cases and this can be explained by using better diagnostic methods including PET scans which allow for the actual findings of the initial stage of the lymphoma. We had no cases that were staged unknown.

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, Cladribrine, 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 Alemtuzumab (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, (autlogous transplant), which uses blood-forming cells collected from the patient and (allogeneic transplant), which uses blood forming cells from a family member of 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 – 38% of the cases were treated with chemotherapy alone or in combination with other treatments. 13% had no first course of treatment and there were 8% of the cases that were only treated with surgery.

Stage 2 – 57% of the cases were treated with chemotherapy alone or in combination with other treatments. 12% had no first course of treatment and there were 4% of the cases that were only treated with surgery.

Stage 3 – 68% of the cases were treated with chemotherapy alone or in combination with other treatments. There were 9% of the cases that had no first course of treatment.

Stage 4 – 67% of the cases were treated with chemotherapy alone or in combination with other treatments. 17% had no first course of treatment.

Compared to the NCDB all stages 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. That also explains why there were fewer cases that had no first course of treatment.

Non-Hodgkin Lymphoma- Diagnosed 2003 - 2008

Treatment by Stage Comparison
National Cancer Data Base vs Mercy Health – Anderson Hospital

Treatment Type	NCDB	MHA	NCDB	MHA	NCDB	MHA	NCDB	MHA	NCDB	MHA	NCDB	MHA
	Stage 1		Stage 2		Stage 3		Stage 4		Stage N/A		Stage Unknown	
Surgery Only	15%	8%	8%	4%	7%	0%	5%	0%	12%	0%	10%	0%
Surgery and Chemotherapy	6%	8%	8%	0%	10%	0%	7%	3%	7%	0%	7%	0%
Radiation and Chemotherapy	8%	13%	7%	15%	2%	9%	3%	0%	1%	0%	3%	0%
Chemotherapy only	17%	13%	26%	19%	32%	50%	33%	47%	19%	0%	25%	0%
Surgery, Chemotherapy and Hormone	2%	0%	3%	4%	6%	0%	4%	6%	1%	0%	2%	0%
Chemotherapy and Hormone	4%	4%	11%	19%	13%	9%	13%	11%	4%	0%	5%	0%
Other Specified Therapy	29%	42%	23%	27%	14%	22%	16%	17%	8%	0%	16%	0%
No 1st Course Rx	20%	13%	14%	12%	16%	9%	19%	17%	47%	0%	33%	0%
% of Cases for Stage Group	18%	20%	15%	21%	20%	26%	30%	30%	1%	2%	17%	0%

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 – Anderson 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. This may be explained because of three of the seven patients with stage 4 had advanced age, precluding optimal cancer treatment of the patients.

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 – Anderson Hospital

Non-Hodgkin Lymphoma-nodal
5 Year Survival Diagnosed 2003

	Year				
	1	2	3	4	5
Stage 1	92.3%	100.0%	92.3%	100.0%	66.6%
Stage 2	92.3%	100.0%	100.0%	85.7%	71.4%
Stage 3	100.0%	100.0%	100.0%	85.7%	85.7%
Stage 4	66.6%	50.0%	50.0%	33.0%	33.0%
Overall	90.9%	87.8%	87.8%	78.7%	72.7%

Summary of Findings and Recommendations:

Sex Comparison – Our male/female incidence is the same as the national distribution; we have seen more males than females. National the percentage for males was 52% and we had 60%. The percentage for females was 48% and we had 40%. This was not felt to be a significant difference.

Histologies: Our histology types have a lesser percentage of large B-cell diffuse lymphoma and an increased percentage of follicular lymphoma which can be explained that the lymphoma is being diagnosed earlier before the follicular lymphoma transforms to the large B-cell diffuse histology.

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

Stage: Our stage had higher incidence of stage 2 and 3 disease and this was explained through the standard of using PET scans which allow for the better diagnosis of the initial stage of the lymphoma. We had no cases that were staged unknown compared to 17% nationally.

Survival: Our survival was higher with all stages except stage 4 when compared to the national data. There were three of seven patients in the group that had advanced age that precluded optimal cancer treatment.

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, and patient care improvement.

Provide access to the Mercy Health – Anderson Hospital Cancer Resource Center to provide the latest clinical trials for promising therapies in the treatment of lymphoma.

Present cases at cancer conference and discuss 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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