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2012 Annual Cancer Program Report

THE NEBRASKA MEDICAL CENTER


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Cancer Committee Chair Report

On behalf of the Cancer Committee at The Nebraska Medical Center, I am pleased to present the 2012 annual cancer report for The Nebraska Medical Center.

At The Nebraska Medical Center, we take great pride in our ability to provide comprehensive and supportive care. We are proud of the large number of medical specialties and staff who are devoted to the care of our patients. At The Nebraska Medical Center, we are dedicated to providing services that enhance the wellbeing of our patients. Our commitment to our patients was reflected in the accreditation by American College of Surgeons Commission on Cancer.

We continue to develop resources that support our ongoing commitment in patient directed services. The initiation and the continued growth of the patient advisory group is one such effort. Furthermore, we have expanded our capabilities in the area of palliative care, which has been extremely beneficial for our patients.

Planning and construction of the Cancer Center is currently under way. This is an extremely exciting project at the medical center as it will allow us to improve both access as well as delivery of high quality cancer care. The cancer center will house the Cancer Hospital, with 108 inpatient beds, outpatient clinic facilities, an infusion center and operating rooms. The hospital is designed to put patients first when it comes to their cancer care. A hospital dedicated to oncology will greatly benefit the metro Omaha population as well as Nebraska and the Midwest.

In addition to the expertise in the management and treatment of cancer, we are committed to efforts in prevention and early detection of cancer. We have successfully implemented a regional lung cancer screening program as well as a comprehensive smoking cessation program. Since lung cancer is the most common cancer in the United States, efforts on early detection and reduction of risk are an important benefit to our community.

In addition to clinical services provided, we also offer a wide range of educational opportunities. We have programs designed to educate oncology providers with up-to-date and cutting edge treatment options. We are also committed to providing educational services for patients and their caregivers. We also have continued our successful partnership with Optum Health to provide an excellent oncology related symposium.

Looking forward, we are committed to continuing our excellence in patient care. By combining comprehensive care with cutting edge technology and research, along with our focus on patients, we plan to continue to be the region's leading destination for cancer care.

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Cancer Committee

John Baker, MD – Pathology
Lynn Borstelmann , RN, MSN, AOCN, NEA-BC – Director, Oncology Services
Jim Commers, MD – Hematology Oncology
Mary Durand, BS, RT, (R)(T) – Manager, Radiation Oncology
June Eilers , PhD, RN, BC, CS – Clinical Nurse Researcher, Oncology
Charles Enke, MD – Radiation Oncology
Theresa Franco, RN, MSN – Executive Director, Cancer Care
Julie Glover – American Cancer Society
James Harper, MD – Pediatric Hematology Oncology
Dawn Jourdan, RN, BSN – Clinical Quality Coordinator, Oncology
Susan Kambhu, MD – Hematology Oncology
Marsha Ketcham , RN, OCN – Clinical Research Nurse Coordinator
Rudy Lackner, MD – Thoracic Surgical Oncology
Chad Lagrange, MD – Urologic Surgery
Rayma Meyers, CTR – Cancer Registry
Jennifer Oliveto, MD – Radiology
Gwen Reiser, MS, CGC – Genetic Counselor
Alan Richards, MD – Head and Neck Surgical Oncology
Jason Roberts, PT – Rehab Services
Aaron Sasson, MD – Cancer Committee Chair – Gastrointestinal Surgical Oncology
Carri Siedlik, APRN – Palliative Care Nurse Practitioner
Sue Stensland, LCSW – Manager, Social Work
Dave Sweeney, M.Div. – Pastoral Care
Jue Wang, MD – Hematology Oncology
Sue Wardian Hartung, RN, MSN, OCN – Patient Education Coordinator, Oncology
Matt Winfrey, MPP – Associate Director for Administration and External Affairs, Eppley Institute for Research in Cancer and Allied Diseases
Ann Yager, BSRT, (R)(T) – Director, Village Pointe Cancer Center

Accreditations and Awards

- National Comprehensive Cancer Network (NCCN)
- National Cancer Institute (NCI) Designation
- Foundation for the Accreditation of Cellular Therapy (FACT)
- Accreditation of Radiation Oncology by American College of Radiology (ACR)
- American College of Surgeons Commission on Cancer (ACoS CoC)
- First hospital in the state to receive the Blue Distinction Center for Rare and Complex Cancers from Blue Cross Blue Shield of Nebraska
- Magnet designation for nursing excellence
- Best Hospitals U.S. News and world Reports - ranked 40th in Cancer

Cancer Center

Leaders from The Nebraska Medical Center and UNMC announced plans for a new cancer center on the main campus in January 2012. The cancer center will fuse the mission of cancer research and patient care while taking one big leap towards the goal of bringing services under one roof.

As the largest project in campus history, what makes the project special to the medical center campus is the unbridled collaborative effort between The Nebraska Medical Center and UNMC.

The new cancer center will be built on the west side of the Midtown Omaha medical center campus. The center will include a 98-laboratory research tower, a 108-bed inpatient treatment center and a multidisciplinary outpatient center.

A project of this size and scope requires a significant amount of time and money. Funding sources are still being sought, including $50 million from the state of Nebraska to support the construction of the cancer research tower. More than 85 percent of the project's costs are expected to come from private funds.

The impact on the local economy is expected to be profound, creating an estimated 1,200 jobs by 2020 with an infusion of $100 million to Nebraska's economy.

As the only National Cancer Institute-designated cancer center in Nebraska, the new center will provide the best in science and clinical practice. The goal is to become an NCI "Comprehensive Cancer Center," a top designation shared by only 41 centers in the U.S.

Research Summary

The Eppley Cancer Center is devoted to excellence in cancer research through basic discovery, clinical/translational research and research in cancer control and prevention. The mission of the Eppley Cancer Center is:

- To coordinate basic, clinical, translational and population science research in cancer throughout the University of Nebraska.
- To promote discovery about the etiology, diagnosis, risk assessment, prevention and treatment of cancer and improve health and quality of life.
- To develop and promote state-of-the-art cancer care at the University of Nebraska Medical Center (UNMC) and its' affiliated hospital, The Nebraska Medical Center.
- To develop and promote cancer education and screening programs including community outreach initiatives with particular emphasis on the underserved populations (minorities and rural populations) in the region.

Significant, Published, Scientific Accomplishments

Following are some of the scientific accomplishments by the Eppley Cancer Center over the past year:

- Drs. **Robert Lewis** and **Michael Brattain** (Cancer Genes and Molecular Regulation Program, or CGMRP) and White and MacMillan (UT Southwestern) used FUSION to identify effectors and mimics of KSR1 loss-of-function. KSR1 is required for human colon tumor cell survival but dispensable for survival of normal colon epithelial cells. This study demonstrates the ability of FUSION to be used to identify targets and small molecules with the potential to yield methods of treatment with high therapeutic indices.

- CGMRP members Drs. **Amarnath Natarajan** and **Tadayoshi Bessho** collaborated to demonstrate that small molecules that functionally mimic BRCA1 or BRCA2 mutations will generate synthetic lethality in breast cancer cells without BRCA1 or BRCA2 mutations (Breast Cancer Research and Treatment, 134, 511-517, 2012). These results provide the basis for developing high affinity BRCT(BRCA1) inhibitors as adjuvants to treat sporadic breast and ovarian cancers.

- Dr. **Surinder Batra** in collaboration with Dr.Vimla Band showed that Ecd is a novel tumor-promoting factor that is differentially expressed in pancreatic cancer and potentially regulates glucose metabolism within cancer cells. The results of this study show that Ecd is highly upregulated in both primary pancreatic tumor and in distant metastatic sites.

- There have been extensive inter-collaborative efforts between investigators and scientists within the Cancer Center. Specifically, Dr. **Michael Brattain** (CGMRP) has engaged in close collaborations with investigators of our Pancreatic Cancer Specialized Program of Research Excellence (SPORE). These efforts have led to the inclusion of Dr. Brattain's project on Novel Strategies for Pancreatic Cancer Treatment into the competitive renewal application of the SPORE grant.

- Lymphoma clinical trials conducted at the Eppley Cancer Center include phase I/II peripheral T-Cell Lymphoma (PTCL) trial of the kinase inhibitor dasatinib which was found to have a relatively high response rate in some patients with relapsed PTCL. Association of the patients who responded with the targets of dasatinib in their lymphoma is currently being correlated.

- Lymphoma Research Program members (Drs. **Kai Fu**, **McKeithan**, **Javeed Iqbal**, **Ding and Wing Chan**) have continued to study the role of microRNA in mantle cell lymphoma including the profiling of a large series of mantle cell lymphoma and other B cell lymphoma to identify the microRNA expression profile in mantle cell lymphoma (MCL). They have identified a diagnostic signature for MCL and most of the microRNA biomarkers can also be detected on formalin fixed paraffin embedded tissues (FFPET).

Helmsley trust awards $3.5 million grant to the Eppley Cancer Center

The Leona M. and Harry B. Helmsley Charitable Trust awarded a $3.5 million grant to the Eppley Cancer Center to fund the Northern Great Plains Personalized Breast Cancer Program, a collaborative effort between the Eppley Cancer Center, Avera Health's Avera Cancer Institute in Sioux Falls, S.D., and other rural health care centers across the Northern Great Plains.

The program will use Eppley's statewide affiliate cancer center network in Nebraska and Avera's network of more than 300 health care locations in five states along with Trinity Health Cancer Center in Minot, N.D., and Sheridan Memorial Hospital, Welch Cancer Center in Sheridan, WY., to provide breast cancer patients with state-of-the-art cancer genomic analysis and personalized cancer treatment options, as well as access to the Eppley Cancer Center's Breast Cancer Collaborative Registry.

Research Summary *(continued)*

"The Eppley Cancer Center is very fortunate to be partnering with the Helmsley Charitable Trust, Avera Health's Avera Cancer Institute, Trinity Cancer Center and Welch Cancer Center to provide access to personalized care to many breast cancer patients in the rural Midwest," said **Ken Cowan, MD, PhD**, director of the Eppley Cancer Center.

Breast biopsies from 1,000 breast cancer patients will be profiled using genome-wide DNA and RNA analysis to identify the entire spectrum of genomic abnormalities in breast cancer over the next three years.

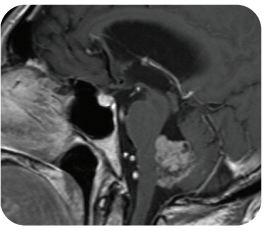
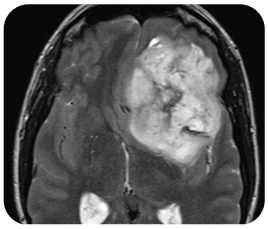
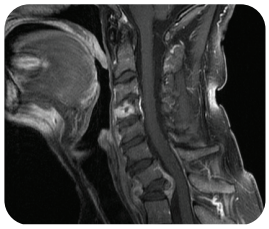
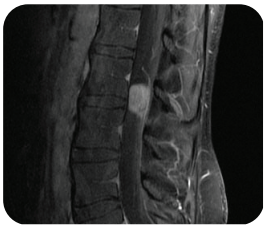
Furthermore, patients will be enrolled on the Breast Cancer Collaborative Registry (BCCR), which collects information from breast cancer patients on: 1) demographics; 2) medical and family history; 3) exposure history; 4) diet; 5) exercise; 6) quality of life; and 7) course of treatment.

Big Ten Cancer Research Consortium

The Eppley Cancer Center at UNMC is a member of the Big Ten Cancer Research Consortium. This consortium is made up of the Big Ten Conference Cancer Centers and the centers will work together to conduct clinical cancer research through collaborative, hypothesis-driven, highly translational oncology trials that leverage scientific and clinical expertise of the Big Ten universities.

American Cancer Society Institutional Research Grant (IRG)

The Cancer Center was awarded an American Cancer Society Institutional Research Grant (IRG) (PI: Cowan). This grant will provide a major source of funding support to junior investigators in the Eppley Cancer Center, and it will enable junior investigators to better develop and enhance their research programs.

The Brain and Spine Center

The Brain and Spine Cancer Center at The Nebraska Medical Center provides front-line diagnosis, treatment, support services and symptom management to patients with brain tumors, spine tumors and tumors involving the nervous system.

At The Brain and Spine Cancer Center, patients have access to a full team of experienced and internationally renowned specialists including neurosurgeons, oncologists and neuro-oncologists, radiation oncologists, mid-level providers, case managers, nutritionists, therapists and social workers to provide patients a full-service, multi-disciplinary approach to their care. The patient works with the group of specialists to develop a personal treatment plan. There is a multidisciplinary neuro-oncology tumor board which meets weekly. Working as a group and implementing this approach provides clear direction for patient treatment.

Complicated tumor cases involving tumors in or within close proximity to the "eloquent areas" of the brain that control speech, motor or sensory functions are treated at the medical center. Among the techniques employed is awake brain surgery where the patient is awake during portions of the operation in order to respond to questions and stimulations. This allows the surgeon to know, in a more precise way than can be learned with pro-operative imaging and neurological/neurophysiological testing, where the surgeon is operating in relationship to the eloquent areas of the patient's brain. This technique allows for the removal of the maximum amount of tumor while allowing the patient to maintain function.

During the treatment process there are many aspects of a patient's life that will be affected. The areas affected may be physical, emotional, and financial. There are people and services to help with adjusting to these changes and to help provide assistance.

The Brain and Spine Cancer Center has a brain tumor education and support group to provide support and knowledge for brain tumor patients and their families. Sessions may include information, resources or expert speakers on various relevant topics. Participants are encouraged to talk and share their experiences and struggles and to celebrate their success.

Brain Cancer Overview

Introduction:

Brain tumors may be primary or secondary. In this review, we will refer to data for primary brain tumors only. Please note, however, there may be items pertinent to both primary and secondary tumors in the diagnosis and treatment discussions below. Furthermore, primary brain tumors may be benign or malignant. Here, we will generally review data for malignant brain tumors.

Most primary brain tumors occur without a known cause and there are not many proven risk factors. It is known that ionizing radiation can result in later development of both meningiomas and malignant gliomas. Nitroso compounds are potentially carcinogenic and there is a low-dose continuous exposure to all humans through the environment and diet. Evidence for this has been inconsistent. Other proposed but unproven factors include: electromagnetic fields, smoking and alcohol. There are a few inherited syndromes that cause an increased risk for development of brain tumors and these are: neurofibromatosis 1 and 2, Von Hippel Lindau syndrome, Lynch syndrome, Turcot syndrome, Li-Fraumeni syndrome and tuberous sclerosis.

The overall average age adjusted incidence rate for development of a primary brain tumor is 21.03 per 100,000 and is higher in females at 22.79 than males at 19.11. When looking at just tumors of neuroepithelial tissue, the rate is 6.6 per 100,000 with a higher incidence in males at 7.76 than females at 5.60. Glioblastoma is the most common malignant primary brain tumor and the most common glioma (Figures 1 and 2). Overall, malignant brain tumors are a rare tumor and therefore, comparisons are often difficult between entities due to numbers needed to be significant. Usually, larger centers may acquire adequate numbers or there is often pooling of data for outcomes assessment.

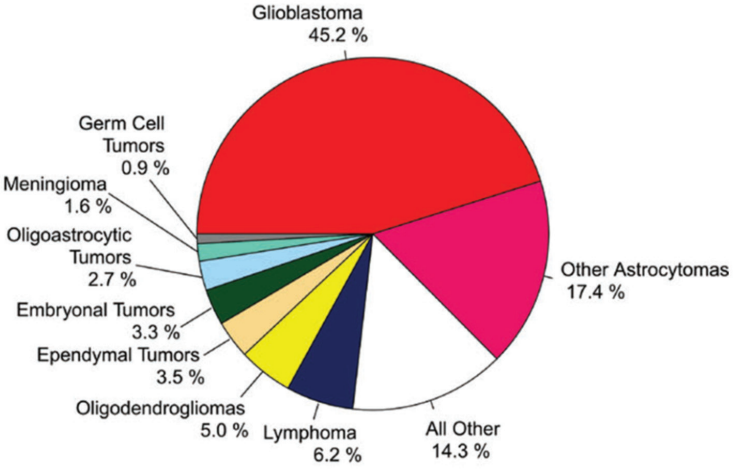


Figure 1: Distribution of primary malignant brain tumor types (CBTRUS 2013).

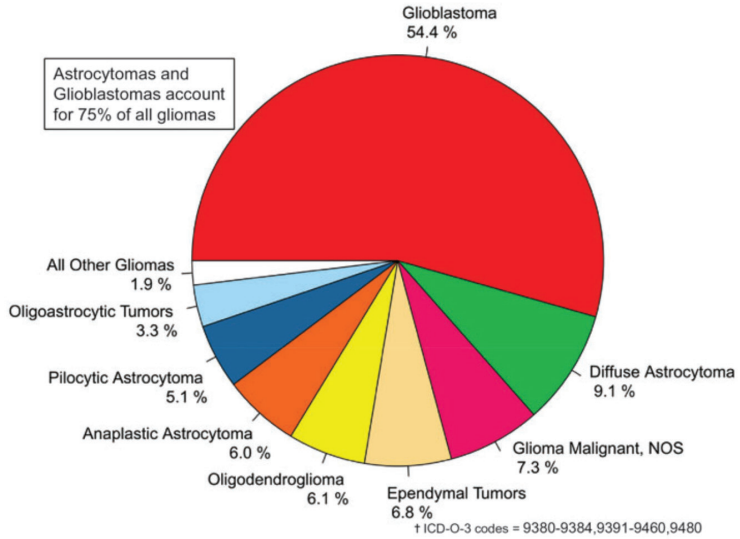


Figure 2: Distribution of histologic subtypes of gliomas (CBTRUS 2013).

Patients with brain tumors are taken care of by a number of different providers. The patient may never see some, such as the neuroradiologist or neuropathologist. Others in the forefront are the neurosurgical oncologist or neurosurgeon, neuro-oncologist and radiation oncologist. Together, these specialty providers work to develop the appropriate diagnosis and treatment plan for the patient.

Diagnosis:

Brain tumors are diagnosed for a number of reasons. Sometimes they may be found on a brain imaging performed for another reason (i.e., head trauma). Often, there is a symptom such as a seizure, change in personality, new neurologic deficit or cogntive changes. Occasionally, patients present with headache. The imaging of choice is MRI. Often a CT may be done initially with an MRI to follow. Based upon imaging features, specialists can generate a pretty accurate differential diagnosis for the tumor. This initial imaging diagnosis helps guide decision making and recommendations. Definitve diagnosis is made with histology, however.

Brain Cancer Overview Overview *(continued)*

Tissue is obtained for definitive diagnsosis either by biopsy or resection. The imaging features are quite important in decision making, as mentioned above. Based upon the presumed pathology, location of tumor, surgeon experience and estimated extent of resection possible, a decision to do a resection or biopsy is made by the neurosurgeon and discussed with the patient. Brain tumors are not assessed by other cancer grading/staging systems. The World Health Organization (WHO) has a separate classification scheme for brain tumors. There is no stage assigned, only histology and a grade. Grades are from I to IV.

Generally, grade I tumors are considered benign. They have low proliferative potential and potential for cure after removal. Grade II tumors are infiltrative, have high recurrence rates and often progress to higher grades. They still have low prolifertive potential. Grade III tumors have evidence of malignancy such as nuclear atypia and mitotic activity. Grade IV tumors are frankly malignant with mitosis and often have necrosis. They generally progress and recur more rapidly. Some grade IV tumors may disseminate throughout the nervous system or rarely metastastize outside of the Central Nervous System (CNS) (malignant meningioma or gliosarcoma). Some tumors such as ependymoma or pineal tumors, however, may disseminate through Cerebrospinal Fluid (CSF) pathways, often because of their locations. Different grading criteria exist for the different histological entities of primary brain tumors. This means that astrocytomas are not graded the same as oligodendrogliomas or ependymomas, for example.

Many neuro-oncology specialists now incorporate molecular features of tumors into their diagnostics, treatment recommendations and prognostic assessments. Examples of this are IDH-1 mutations in astrocytomas and oligodendrogliomas, MGMT promotor methylation status in glioblastoma or co-deletions of 1p and 19q in oligodendromgliomas. The presence of these in the various tumor types confers a better prognosis or response to therapy.

Treatment:

Initial treatment for brain tumors generally involves surgery, either biopsy or resection. This, at minimum, gives the histological diagnosis and grade. Based upon this, further treatment recommendations are made which may include observation, chemotherapy, radiation, or chemoradiation. There is significant evidence in support of a greater extent of resection having a positive impact on survival times, both progression free and overall. This is for all grades of tumors. For grade II tumors, there is data to support reduced rates of malignant transformation and increased overall survival times.

Most grade I and grade II tumors are observed after resection, even if the resection was subtotal. For grade III

tumors, adjuvant therapy is recommended. Whether it is chemotherapy or radiation or both is dependent upon the tumor type and its molecular features. For grade IV tumors, usually a combination of chemotherapy and radiation are recommended. It may be successive or concurrent, depending upon tumor type.

In addition to specially trained neuro-oncology providers, a multi-disciplinary tumor board conference is essential to optimize patient outcomes. This is where the various neuro-oncology specialties confer and discuss individual cases and make treatment recommendations. In this way, all aspects of patient and tumor are considered. We hold this conference weekly here at The Nebraska Medical Center.

Clinical Trials:

Clinical trials exist to enhance knowledege and expose patients to new treatment options or combinations of treatments. We seek to know what is the best way to treat a particular tumor type or whether a new medication or a new combination of current medications may provide survival benefit. Clinical trials exist at the national level or at the institutional level. We participate in brain tumor clinical trials which are investigator initiated (local), national and sponsored.

Treatment Outcomes:

The table below compares observed survival data for glioblastoma (grade IV astrocytoma) for The Nebrasksa Medical Center and National Oncology Data Alliance (NODA). As mentioned previously, brain tumor numbers are small, making comparisons beyond two years difficult.

Observed Survival Data For Glioblastoma 2007-2011

Survival Time	National Oncology Data Alliance (NODA)	The Nebraska Medical Center
1 year	42%	47%
2 years	18%	17%

Community Involvement
A Trip to Remember

Mark Schulte, (Oncology Hematology Special Care Unit) OHSCU nurse, is pictured here with our teen oncology patients (from left to right) Katie Stapleton, Derek Clayton and Megan Niblock. The trip was paid for through the Sunshine Kids Foundation, an organization dedicated to kids with cancer.

He had only worked here for four months, so he had every reason to believe it was a long shot. But Mark Schulte, a nurse on the Oncology Hematology Specialty Care Unit at The Nebraska Medical Center, responded to her email anyway. Debbie Wagers, certified child life specialist at The Nebraska Medical Center, was looking for one volunteer to take a trip to Washington, D.C. with three of our teen oncology patients. The trip was offered through Sunshine Kids Foundation, an organization focused on improving the lives of children with cancer. They offer activities to encourage kids to have fun and celebrate life. This would be the first year our hospital took part. And Schulte soon found out he'd be going.

"The trip was amazing," said Schulte. From May 7 to 13, 2012, the group, made up of kids from around the country, travelled all over D.C. "Everyone there was so great to talk to, just genuinely really good people." Sunshine Kids paid all the expenses and Schulte said they were very attentive to the teens' needs, making sure snacks were always available, processing daily lab draws and more.

Schulte's role was to chaperone the three teens from our hospital as well as monitor their health. "I kept an eye on how they were doing. We did a lot of walking, so if one of them needed a wheelchair, I encouraged them to use one."

"These kids shared a lot of emotional stories throughout the week," said Schulte. "It was a really great experience for them to be able to talk with other kids going through the same thing."

He says he'd love to do this again. "It was a great opportunity for me. I was really happy to be involved. I had been looking for a volunteer opportunity, so it felt good to be part of something." He's also grateful to his manager who changed his schedule to accommodate the request. "I used up all my paid time off to go," Schulte joked, as he didn't have much to begin with. "It was worth it."

Cancer Registry Overview

The Nebraska Medical Center's Cancer Registry collects, analyzes and reports data on persons who are diagnosed and/or treated for a malignancy at The Nebraska Medical Center and Bellevue Medical Center. A requirement of the American College of Surgeon's Commission on Cancer accreditation since 1956, the Cancer Registry is useful in many ways including:

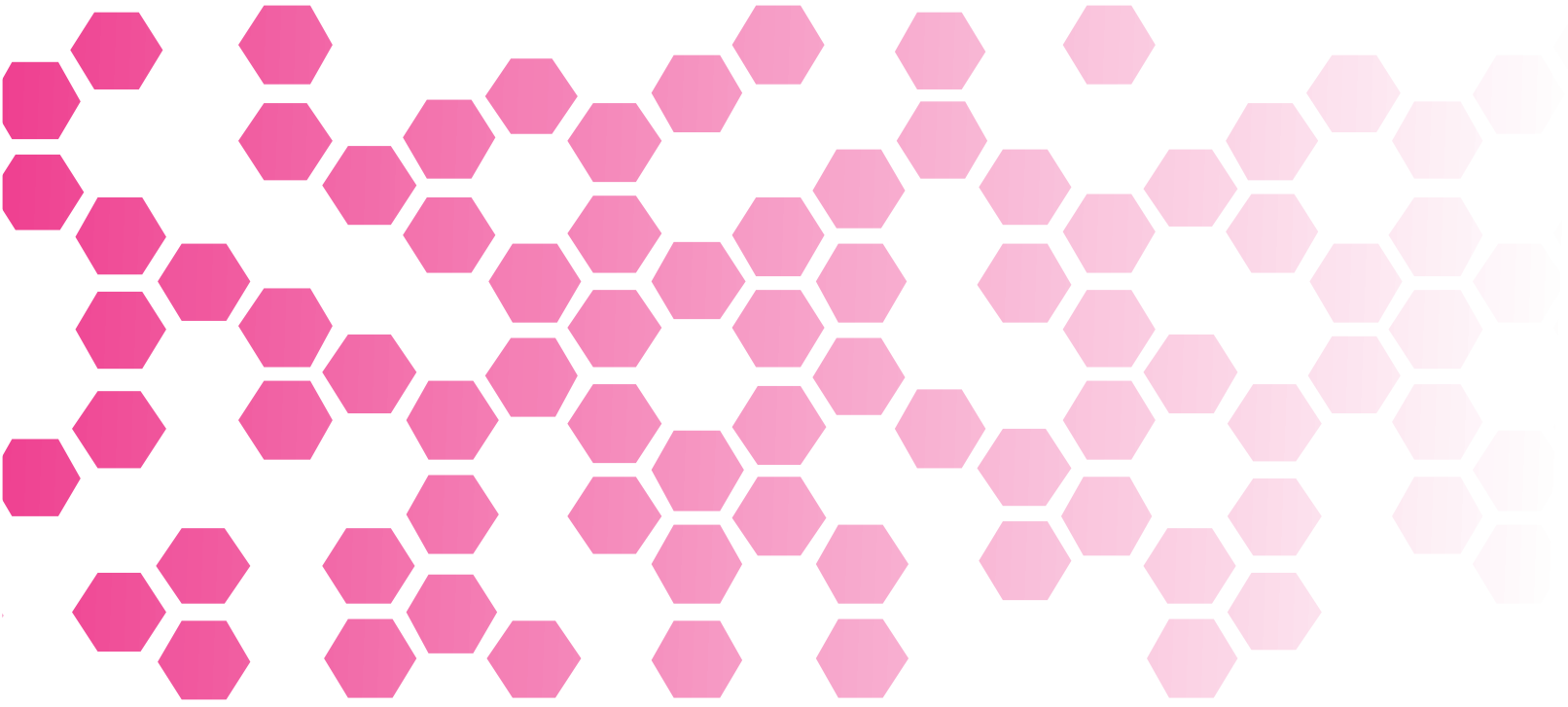
- Local, state and national cancer agencies use registry data in defined areas to make important public health decisions to maximize the effectiveness of limited public health funds, such as the placement of screening programs.
- Valuable research tools for those interested in the etiology, diagnosis and treatment of cancer.
- Fundamental research on the epidemiology of cancer is initiated using the accumulated data.
- Lifetime follow up is an important aspect of the cancer registry. Current patient follow up serves as a reminder to physicians and patients to schedule regular clinical examinations and provides accurate survival information.

The Cancer Registry can provide a variety of useful reports. Countless hours are spent abstracting this data not only for state and national reporting purposes, but also for use by our faculty and staff. The registry staff appreciates clinicians' efforts in thorough documentation of staging as well as response to follow-up information requests sent out by the Cancer Registry. Through your efforts, we are able to maintain quality records to be reported and accessed by many entities.

Data elements collected by the Cancer Registry staff include:

- Demographic information: Age, gender, race/ethnicity, birthplace and residence.
- Medical history: Physical findings, screening information, occupation and any history of a previous cancer.
- Diagnostic findings: Types, dates and results of procedures used to diagnose cancer.
- Cancer information: Primary site, cell type and extent of disease.
- Cancer therapy: Surgery, radiation therapy, chemotherapy, hormone or immunotherapy.
- Follow up: Annual information concerning treatment, recurrence and patient status is updated to maintain accurate surveillance information.

The registry at The Nebraska Medical Center contains information on cases diagnosed between 2003 and 2012. We are happy to work with you to develop reports to meet your needs based on the cancer experience at The Nebraska Medical Center. Please call 402-596-3167 for assistance.



Primary Site Table 2012

Primary Site	Total (%)	Sex		Class of Case		Status		Stage Distribution - Analytic Cases Only						
		M	F	Analy	NA	Alive	Exp	Stg 0	Stg I	Stg II	Stg III	Stg IV	N/A	Unk
ORAL CAVITY & PHARYNX	**98 (3.6%)**	**64**	**34**	**78**	**20**	**75**	**23**	**5**	**20**	**7**	**6**	**38**	**1**	**1**
Lip	5 (0.2%)	2	3	3	2	5	0	0	2	0	0	1	0	0
Tongue	24 (0.9%)	16	8	21	3	19	5	3	4	2	1	11	0	0
Salivary Glands	10 (0.4%)	3	7	10	0	8	2	0	3	3	0	4	0	0
Floor of Mouth	1 (0.0%)	0	1	1	0	1	0	0	0	0	0	1	0	0
Gum & Other Mouth	21 (0.8%)	12	9	17	4	13	8	1	7	1	0	8	0	0
Nasopharynx	2 (0.1%)	1	1	2	0	2	0	0	0	0	1	1	0	0
Tonsil	20 (0.7%)	17	3	12	8	18	2	1	3	1	2	5	0	0
Oropharynx	4 (0.1%)	3	1	2	2	3	1	0	1	0	0	1	0	0
Hypopharynx	10 (0.4%)	9	1	9	1	5	5	0	0	0	2	6	0	1
Other Oral Cavity & Pharynx	1 (0.0%)	1	0	1	0	1	0	0	0	0	0	0	1	0
DIGESTIVE SYSTEM	**508 (18.6%)**	**302**	**206**	**347**	**161**	**359**	**149**	**10**	**58**	**91**	**77**	**87**	**9**	**15**
Esophagus	32 (1.2%)	27	5	20	12	20	12	0	3	6	2	6	0	3
Stomach	35 (1.3%)	28	7	20	15	27	8	1	2	2	7	7	0	1
Small Intestine	21 (0.8%)	15	6	12	9	18	3	0	1	1	5	4	1	0
Colon Excluding Rectum	130 (4.8%)	59	71	88	42	104	26	6	14	26	22	17	1	2
Cecum	24	10	14	17	7	18	6	1	3	7	4	2	0	0
Appendix	9	2	7	4	5	8	1	0	0	1	0	2	1	0
Ascending Colon	33	17	16	26	7	26	7	1	3	8	8	6	0	0
Hepatic Flexure	4	2	2	2	2	1	3	0	2	0	0	0	0	0
Transverse Colon	6	2	4	5	1	5	1	0	0	1	2	1	0	1
Splenic Flexure	3	1	2	3	0	2	1	1	1	1	0	0	0	0
Descending Colon	10	3	7	6	4	9	1	1	1	2	0	1	0	1
Sigmoid Colon	36	20	16	23	13	33	3	2	4	5	8	4	0	0
Large Intestine, NOS	5	2	3	2	3	2	3	0	0	1	0	1	0	0
Rectum & Rectosigmoid	52 (1.9%)	32	20	36	16	42	10	2	4	5	16	8	0	1
Rectosigmoid Junction	9	8	1	2	7	8	1	1	0	0	1	0	0	0
Rectum	43	24	19	34	9	34	9	1	4	5	15	8	0	1
Anus, Anal Canal & Anorectum	14 (0.5%)	4	10	8	6	12	2	1	1	1	4	0	0	1
Liver & Intrahepatic Bile Duct	72 (2.6%)	50	22	56	16	48	24	0	22	13	8	6	5	2
Liver	67	49	18	52	15	44	23	0	21	12	8	5	5	1
Intrahepatic Bile Duct	5	1	4	4	1	4	1	0	1	1	0	1	0	1
Gallbladder	9 (0.3%)	2	7	5	4	7	2	0	0	2	1	2	0	0
Other Biliary	15 (0.5%)	6	9	12	3	8	7	0	3	3	1	2	1	2
Pancreas	116 (4.2%)	73	43	81	35	64	52	0	7	30	8	33	0	3
Retroperitoneum	6 (0.2%)	5	1	5	1	6	0	0	1	2	2	0	0	0
Peritoneum, Omentum & Mesentery	5 (0.2%)	0	5	3	2	3	2	0	0	0	1	2	0	0
Other Digestive Organs	1 (0.0%)	1	0	1	0	0	1	0	0	0	0	0	1	0
RESPIRATORY SYSTEM	**309 (11.3%)**	**157**	**152**	**229**	**80**	**180**	**129**	**0**	**51**	**24**	**54**	**97**	**3**	**0**
Nose, Nasal Cavity & Middle Ear	8 (0.3%)	5	3	5	3	7	1	0	1	0	0	3	1	0
Larynx	23 (0.8%)	14	9	17	6	20	3	0	5	2	5	5	0	0
Lung & Bronchus	274 (10.0%)	136	138	205	69	149	125	0	45	22	49	89	0	0
Pleura	1 (0.0%)	1	0	1	0	1	0	0	0	0	0	0	1	0
Trachea, Mediastinum & Other Respiratory Organs	3 (0.1%)	1	2	1	2	3	0	0	0	0	0	0	1	0
BONES & JOINTS	**26 (1.0%)**	**17**	**9**	**17**	**9**	**25**	**1**	**0**	**9**	**5**	**0**	**2**	**0**	**1**
SOFT TISSUE (including Heart)	**47 (1.7%)**	**24**	**23**	**37**	**10**	**40**	**7**	**0**	**17**	**5**	**10**	**3**	**0**	**2**
SKIN EXCLUDING BASAL & SQUAMOUS	**115 (4.2%)**	**58**	**57**	**88**	**27**	**101**	**14**	**20**	**39**	**10**	**10**	**1**	**3**	**5**
Melanoma -- Skin	98 (3.6%)	52	46	74	24	87	11	20	32	10	8	1	0	3
Other Non-Epithelial Skin	17 (0.6%)	6	11	14	3	14	3	0	7	0	2	0	3	2

Primary Site Table 2012 *(continued)*

Primary Site	Total (%)	Sex		Class of Case		Status		Stage Distribution - Analytic Cases Only						
		M	F	Analy	NA	Alive	Exp	Stg 0	Stg I	Stg II	Stg III	Stg IV	N/A	Unk
BREAST	**338 (12.4%)**	**5**	**333**	**264**	**74**	**324**	**14**	**48**	**111**	**67**	**23**	**12**	**0**	**3**
FEMALE GENITAL SYSTEM	**136 (5.0%)**	**0**	**136**	**97**	**39**	**123**	**13**	**2**	**49**	**11**	**22**	**8**	**1**	**4**
Cervix Uteri	18 (0.7%)	0	18	13	5	17	1	0	6	5	2	0	0	0
Corpus & Uterus, NOS	58 (2.1%)	0	58	49	9	53	5	0	33	1	9	3	1	2
Corpus Uteri	56	0	56	47	9	51	5	0	31	1	9	3	1	2
Uterus, NOS	2	0	2	2	0	2	0	0	2	0	0	0	0	0
Ovary	36 (1.3%)	0	36	23	13	32	4	0	5	2	10	5	0	1
Vagina	4 (0.1%)	0	4	3	1	3	1	0	0	2	0	0	0	1
Vulva	18 (0.7%)	0	18	7	11	16	2	2	4	1	0	0	0	0
Other Female Genital Organs	2 (0.1%)	0	2	2	0	2	0	0	1	0	1	0	0	0
MALE GENITAL SYSTEM	**175 (6.4%)**	**175**	**0**	**120**	**55**	**169**	**6**	**0**	**17**	**66**	**20**	**12**	**0**	**5**
Prostate	158 (5.8%)	158	0	109	49	153	5	0	12	63	20	10	0	4
Testis	9 (0.3%)	9	0	5	4	9	0	0	2	2	0	0	0	1
Penis	7 (0.3%)	7	0	5	2	6	1	0	3	0	0	2	0	0
Other Male Genital Organs	1 (0.0%)	1	0	1	0	1	0	0	0	1	0	0	0	0
URINARY SYSTEM	**149 (5.5%)**	**108**	**41**	**118**	**31**	**121**	**28**	**17**	**40**	**16**	**17**	**21**	**2**	**5**
Urinary Bladder	66 (2.4%)	51	15	45	21	53	13	14	11	8	3	9	0	0
Kidney & Renal Pelvis	79 (2.9%)	55	24	69	10	65	14	2	29	8	11	12	2	5
Ureter	4 (0.1%)	2	2	4	0	3	1	1	0	0	3	0	0	0
EYE & ORBIT	**8 (0.3%)**	**7**	**1**	**7**	**1**	**8**	**0**	**0**	**1**	**1**	**0**	**0**	**4**	**1**
BRAIN & OTHER NERVOUS SYSTEM	**147 (5.4%)**	**75**	**72**	**101**	**46**	**122**	**25**	**0**	**0**	**0**	**0**	**0**	**101**	**0**
Brain	69 (2.5%)	42	27	44	25	51	18	0	0	0	0	0	44	0
Cranial Nerves Other Nervous System	78 (2.9%)	33	45	57	21	71	7	0	0	0	0	0	57	0
ENDOCRINE SYSTEM	**89 (3.3%)**	**33**	**56**	**74**	**15**	**84**	**5**	**0**	**38**	**5**	**10**	**13**	**6**	**2**
Thyroid	76 (2.8%)	26	50	66	10	72	4	0	38	5	10	11	0	2
Other Endocrine including Thymus	13 (0.5%)	7	6	8	5	12	1	0	0	0	0	2	6	0
LYMPHOMA	**291 (10.7%)**	**161**	**130**	**144**	**147**	**265**	**26**	**0**	**23**	**27**	**9**	**76**	**3**	**3**
Hodgkin Lymphoma	52 (1.9%)	24	28	29	23	52	0	0	2	14	3	8	0	1
Hodgkin - Nodal	51	24	27	28	23	51	0	0	2	14	3	7	0	1
Hodgkin - Extranodal	1	0	1	1	0	1	0	0	0	0	0	1	0	0
Non-Hodgkin Lymphoma	239 (8.8%)	137	102	115	124	213	26	0	21	13	6	68	3	2
NHL - Nodal	162	98	64	69	93	141	21	0	7	7	6	45	0	2
NHL - Extranodal	77	39	38	46	31	72	5	0	14	6	0	23	3	0
MYELOMA	**77 (2.8%)**	**51**	**26**	**53**	**24**	**64**	**13**	**0**	**0**	**0**	**0**	**0**	**52**	**0**
LEUKEMIA	**118 (4.3%)**	**74**	**44**	**75**	**43**	**89**	**29**	**0**	**0**	**0**	**0**	**0**	**75**	**0**
Lymphocytic Leukemia	48 (1.8%)	34	14	27	21	42	6	0	0	0	0	0	27	0
Acute Lymphocytic Leukemia	14	7	7	11	3	11	3	0	0	0	0	0	11	0
Chronic Lymphocytic Leukemia	30	23	7	13	17	28	2	0	0	0	0	0	13	0
Other Lymphocytic Leukemia	4	4	0	3	1	3	1	0	0	0	0	0	3	0
Myeloid & Monocytic Leukemia	67 (2.5%)	38	29	46	21	45	22	0	0	0	0	0	46	0
Acute Myeloid Leukemia	50	25	25	35	15	32	18	0	0	0	0	0	35	0
Acute Monocytic Leukemia	3	3	0	3	0	2	1	0	0	0	0	0	3	0
Chronic Myeloid Leukemia	14	10	4	8	6	11	3	0	0	0	0	0	8	0
Other Leukemia	3 (0.1%)	2	1	2	1	2	1	0	0	0	0	0	2	0
Other Acute Leukemia	1	1	0	1	0	1	0	0	0	0	0	0	1	0
Aleukemic, Subleukemic & NOS	2	1	1	1	1	1	1	0	0	0	0	0	1	0
MESOTHELIOMA	**4 (0.1%)**	**2**	**2**	**4**	**0**	**3**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**1**
MISCELLANEOUS	**95 (3.5%)**	**57**	**38**	**54**	**41**	**67**	**28**	**0**	**0**	**0**	**0**	**0**	**54**	**0**
Total	**2,730**	**1,370**	**1,360**	**1,907**	**823**	**2,219**	**511**	**102**	**473**	**336**	**259**	**371**	**314**	**48**

Exclusions: Not Male and Not Female 0

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