



NORTHWEST HOSPITAL  
& MEDICAL CENTER



**2006**

# **Cancer Program Annual Report**

with Statistical Data from 2005



**Mission**

**Our Mission is to raise the long-term health status of our community by providing personalized quality care with compassion, dignity and respect.**

**Vision**

**Northwest Hospital is a community of caring health professionals, valued and recognized for promoting wellness through early detection and prevention, minimally invasive interventions and innovative clinical practices.**

## TABLE OF CONTENTS

Cancer Committee Members .....	2
Cancer Committee Chairman’s Report .....	3
What is the Role of the Cancer Liaison? .....	3
Top 5 Sites for 2005 .....	4
Cancer Conference / Tumor Board Activities.....	4
Lung Cancer Treatment at Northwest: <i>A Patient Story</i> .....	5
Nurses at the Bedside .....	6
PET-CT in the NWHMC Cancer Patient Population.....	6-7
PET-CT Radiation Treatment Planning: <i>A New Technique Now Available Through a Collaboration between Northwest Hospital, Swedish Cancer Institute, and Via Radiology</i> .....	8
Breast MRI for Breast Cancer Diagnosis .....	9
Lymphedema Update.....	9
Cancer Registry Update .....	10
Breast Cancer Survival Study .....	11
Radiofrequency Ablation.....	12
High Tech and High Touch: <i>Nursing Services Bridge the Gap</i> .....	12-13
Gardasil.....	13
Immunohistochemistry: <i>A Powerful Tool for Cancer Diagnosis and Therapy</i> .....	14
Targeted Therapy-Another Option.....	15
2005 Cancer Cases: Site Distribution Report .....	16

## **CANCER COMMITTEE MEMBERS**

David E. Dong, MD, Medical Oncology, Cancer Committee Chairman, Coordinator-QA Cancer Registry Data

Rodney Kratz, MD, Colon & Rectal Surgery, ACoS Physician Liaison

Lorna Andrews, RN, Director of Patient Care Services

Greg Bates, CNS, Psychiatric/Mental Health

George R. Birchfield, MD, Medical Oncology

Emily Bradley, MD, Urology

Mark T. Brakstad, MD, General Surgery

Karen Brandstrom, RN, MSN, Care Management/Social Services

Denise E. Cho, MD, Gynecology & Obstetrics

Mark Cortezzo, Decision Support Manager

Pat Fitch, RD, Clinical Dietitian-Oncology/Surgery & ICU/Telemetry

Judith Folks, MN, Performance Improvement

Jean Fritz, OTR/L, Center for Medical Rehabilitation Services

Marc Jacobson, MD, Diagnostic Radiology

Dan Kim, PharmD, Pharmacy

Douglas J. Lee, MD, Hospice/Pain

Robert Meier, MD, Radiation Oncology

Brad Nadir, CIS Cancer Registrar

Michele Owen, RN, MPA, Nursing Unit Manager-4th Floor

Mary Jo Sarver, ARNP, CNS, AOCN, Oncology/IV Therapy Clinical Nurse Specialist  
Coordinator-Community Outreach, ACS Representative

Charles R. Simrell, MD, Pathology

Sam Taagen, MD, Primary Care (Internal Medicine)

Walter Trautman, MD, Anesthesiology/Pain

Gayle Ward, MN, VP of Clinical Services/CNO

Lavonne Williams, Clinical Market Developer, Center for Rehabilitation & Gamma Knife

## CANCER COMMITTEE CHAIRMAN'S REPORT

It is my privilege to present to you the 2005 community data on analytical cancer cases at Northwest Hospital & Medical Center. Northwest Hospital continues to collaborate with Swedish Tumor Institute for its radiation oncology services and with the Puget Sound Cancer Centers for its medical oncology services.

This year's annual report focuses on new advances in technology in identifying, diagnosing and treating malignancies. Innovations in positron emission tomography combined with computed tomography (PET-CT), radiofrequency ablation, and breast MRI with MRI-guided biopsies are all recent advances in allowing improved care and treatment for patients with cancer and other illnesses, and are all available at Northwest Hospital. Other recent advances in cancer care such as immunohistochemistry in pathology and the cervical cancer vaccine for cancer prevention also are highlighted here.



Northwest Hospital continues to increase supportive care measures for patients from all regions of King County. We have continued to partner with Cancer Lifeline to offer an array of different weekly and bi-weekly support groups. These resources can be found and accessed on the Northwest Hospital website. Additionally, Northwest Hospital, in conjunction with the Seattle Breast Center will be continuing its unique, offsite patient support program with "Northwest Casting Call," a biannual weekend fly-fishing experience for cancer patients and survivors.

Northwest Hospital continues to emphasize the region's first all-campus, no-smoking policy for staff, faculty, patients and visitors.

In closing, I'd like to express my appreciation to the members of the Cancer Committee and the community at large for their support.

Sincerely,  
David E. Dong, MD, PhD  
Cancer Committee Chairman

## WHAT IS THE ROLE OF THE CANCER LIAISON?



Cancer Liaison physicians are charged with the task of spearheading Cancer Committee initiatives. They are physician/committee champions responsible for providing leadership and direction to establish, maintain and support their facility's cancer program; improve clinical practice at the local level; and collaborate with local agencies to reduce the burden of cancer in the community.

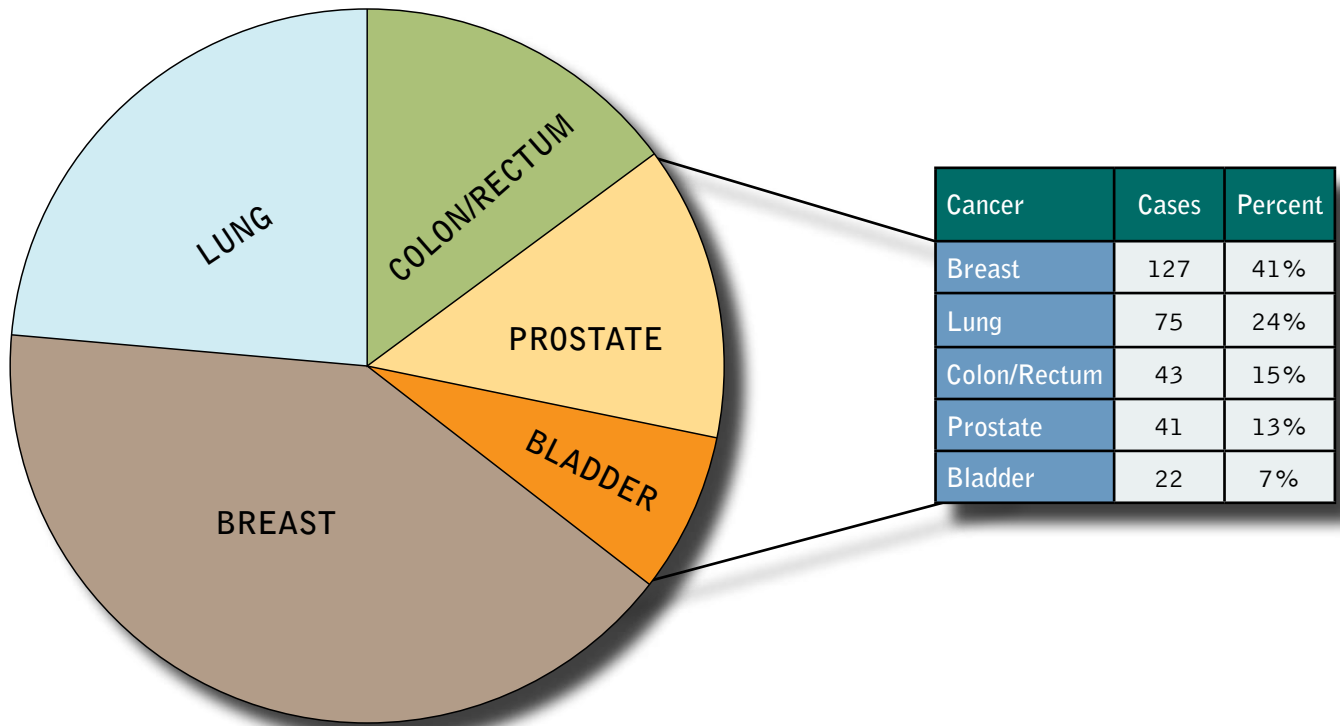
There are three goals associated with this responsibility: First, to serve as a physician/committee champion within the cancer program by improving the quality of care within your facility. Second, to promulgate Cancer Committee initiatives at the local level by data submission, survey/study participation and attendance at meetings held by Cancer Committee and the Washington State Chair. Third, to serve as an agent of change within the community by strengthening relationships with support services such as the American Cancer Society, Cancer Lifeline, etc. and reducing the burden of cancer in the community by acting as an advocate.

Northwest Hospital & Medical Center has participated in many committees and events throughout 2006 not only to meet, but to exceed the expectations of assisting cancer patients in our local community, and on a state and national level as well. In the pages of this annual report you will barely uncover the dedication and hard work that committee members and their colleagues have contributed over the past year. It is my honor and privilege to work with such a dedicated team and I look forward to continuing these efforts in 2007.

If you have any special projects or interest that you believe fall under the goals of the Cancer Committee please feel free to contact me. We are always looking for motivated individuals to join our team in order to make cancer care as seamless and easy for patients and families as possible.

Sincerely,  
Rodney Kratz, MD  
ACoS Physician Liaison

## TOP FIVE SITES FOR 2005



## CANCER CONFERENCE / TUMOR BOARD ACTIVITIES

*by Judith Folks, MN*

Tumor Board, Breast, Chest and Gynecology Conferences continue to play a vital role in setting the high standard for staging, treatment planning and care of cancer patients and their families at Northwest Hospital & Medical Center. Each conference is comprised of a multidisciplinary team of physicians, nurses and other hospital-wide ancillary personnel. Breast Conference and Tumor Board meet each Wednesday from 7:00 to 8:00 am and 12:30 to 1:30 pm, respectively, and Chest Conference meets on the 2<sup>nd</sup> and 4<sup>th</sup> Tuesdays of each month from 7:00 to 8:00 am. Gynecology Conference is held bimonthly, on the 2<sup>nd</sup> Thursday of odd months, from 7:30 to 8:30 am. All meetings are held in the Cancer Center Conference Room in the Medical Office Building. One hour of Category 1 CME credit is granted to attendees at each of the four meetings.

During 2005, approximately 92.7% of our newly diagnosed cases were discussed prospectively at one of the 126 meetings held throughout the year. Primary site discussion included not only the top five sites diagnosed at Northwest Hospital & Medical Center, (breast, lung, colon and rectum, prostate and bladder), but also sites of kidney, brain, pancreas, lymphoid neoplasms, gynecological cancers, skin/melanoma, carcinoid tumor, oral cancers and metastatic cancers.

The ongoing case management discussions and didactic conferences serve as an invaluable tool in our perpetual goal of providing a standard of excellence in cancer care to our community.

# LUNG CANCER TREATMENT AT NORTHWEST: A PATIENT STORY

by Pamela Sowers, Media Publications Coordinator

After years of working in the aerospace industry, Julius Williams was enjoying his job as a report operator for Metro. He would drive his bus along a different route each work day, seeing Seattle's neighborhoods and meeting a different crowd of commuters. It was during this time that Williams developed a cough, accompanied by a tremendous pain in his side. It finally got so bad that he ended up in an emergency room one night.

The news wasn't good. The emergency physician ordered tests, leading to an MRI and, ultimately, a diagnosis: inoperable lung cancer. Julius was shocked. He'd quit smoking 12 years earlier, hoping to avoid lung cancer. For whatever reason, Julius was now in a growing cohort of cancer victims.

According to statistics from the U.S. Centers for Disease Control and the American Cancer Institute, lung cancer is the second most common cancer among white, black, Asian/Pacific Islander, and American Indian/Alaska Native men, and the third most common cancer among Hispanic men. It is the second most common cancer among white and American Indian/Alaska Native women, and the third most common cancer among black, Asian/Pacific Islander, and Hispanic women. 105,508 men and 84,789 women were diagnosed with lung cancer in 2003, the latest year for which statistics are available.

Julius went on leave from his job, and started learning a lot about cancer and treatments. He paid close attention to the patient education he was receiving at Northwest Hospital and Puget Sound Cancer Centers. It's something he figures he'll be passing along to his friends at work when he returns. "I've gotten a crash course in the medical field," Julius says. "I work with a bunch of really nosy guys, and they gossip so much. It's a good way to get the information out there!"

This positive attitude is carrying Julius through the treatment process, which has included a number of clinical trials and several rounds of chemotherapy. He says it helps that he's seeing that same optimistic approach in the people providing his care.

"I couldn't have picked a better place than Northwest," he says. "The people here are just unbelievable – the way they treat you. I've never had one bad moment or one misunderstanding in the two-and-a-half years I've been coming here. I've never seen any confusion or bickering, and that makes a whole lot of difference. They are just so professional."

Dr. Douglas Lee returns the compliment: "Julius is one of the most positive and energetic patients I have had the privilege of knowing. He always has a good word for the staff and fellow patients. We are very grateful that he has battled cancer to a standstill and weathered the side-effects of his treatment. He is a true source of inspiration to us all."



*"We are very grateful that he has battled cancer to a standstill and weathered the side-effects of his treatment. He is a true source of inspiration to us all."*

*-Dr. Douglas Lee*

## NURSES AT THE BEDSIDE

by Mary Jo Sarver, MN, ARNP, AOCN

2006 was a year of many exciting changes and challenges for the oncology nursing staff at Northwest Hospital & Medical Center. Procedures, treatments and the number of resources needed to treat patients from diagnosis to end-of-life care have all grown substantially. On top of treatment-related changes are the many programs that advocate superior performance in healthcare, such as the 2006 National Safety Goals from the Joint Commission, Leap Frog, the 100K Lives Program and the CMS measures. These programs were all developed to ensure that evidence-based practice is being used consistently to improve patient outcomes and to track documentation. Because of the multiple changes, it has become more and more challenging and important for acute care facilities to keep staff updated and informed in order to provide safe and efficient care.

Numerous multidisciplinary teams, projects, procedures and services have evolved out of new therapies and participation in healthcare initiatives. The enthusiasm and dedication of the nurses is paramount to the process as they are the ones at the bedside assessing needs, following through with orders, documenting and educating. A more holistic approach to patient care in the hospital has resulted in a broadening of the nurses' focus on all aspects of the patient's health, including smoking cessation, blood sugar control, dietary balance, lifestyle changes, vaccinations and a more complete and accurate documentation of the patient's medication record (medication reconciliation).

Oncology nurses at Northwest Hospital & Medical Center stood up to the challenges of 2006 and have assisted in developing,



incorporating and evaluating policy and procedure changes. Unlike many specialty areas, the oncology service covers multiple disciplines and service lines. Nurses have had to coordinate with dietary, pharmacy, multiple physician groups (surgery, medical oncology, radiation oncology, pulmonology, cardiology, primary care, etc.), IV services, lab, outpatient private practice and imaging centers as well. Along with the coordination also came the development of an education plan that incorporates all necessary disciplines and ensures continuity of care. It is a great comfort to our patients and their families to know that nurses on the front lines are embracing these healthcare initiatives and programs and implementing them with every admission, hospital stay and discharge to provide the best care and outcomes achievable.

## PET-CT IN THE NWHMC CANCER PATIENT POPULATION

by Marc G. Jacobson, MD

Positron emission tomography (PET) combined with computed tomography (CT) is the newest and most powerful diagnostic imaging tool in the evaluation of oncology patients. By fusing the physiologic data from PET scans with the high resolution anatomic accuracy of thin-slice CT, we can achieve an unprecedented level of diagnostic accuracy.

In July 2006, the latest generation of PET-CT units was installed at Via Radiology – Meridian Pavilion, a Northwest Hospital & Medical Center joint venture. Via Radiology is a diagnostic radiology group that has served the community for more than 45 years. Now, state-of-the-art PET-CT services are changing the way cancer is diagnosed, staged and treated in our patient population.

The evolution of PET into the modality that is accepted and increasingly utilized today has been relatively slow compared with other diagnostic imaging tools such as MRI. The first successful PET image was published in 1983, yet it was not until 1998 that

the federal government authorized reimbursement for PET scans in oncology.

In 2000, there was just one PET scanner in Seattle. Today, there are 11 PET and PET-CT scanners in the area, and this growth is directly tied to the willingness of Medicare and private insurance companies to pay for the exams. Currently, Medicare will authorize PET-CT scans for diagnosis, staging and restaging of colorectal cancer, esophageal cancer, head and neck cancers (excluding brain and thyroid), lung cancer (non-small cell), lymphoma, melanoma, and solitary pulmonary nodule. There also is reimbursement for staging, restaging and evaluating the effectiveness of chemotherapy in patients with breast cancer, restaging of thyroid cancer after prior treatment, and staging of cervical cancer.

The list of recognized indications is growing, and the federal government has created the National Oncology PET Registry (NOPR) to allow reimbursable PET-CT scans in essentially any

Medicare patient with cancer of any kind if the indication is not on the above list, as long as the referring doctor answers a few questions before and after the scan, and the PET-CT facility is registered with the NOPR. Via Radiology – Meridian Pavilion is a NOPR-registered facility. Therefore, PET-CT scans are now available to the vast majority of oncology patients in our community.

Usually, the diagnosis of cancer is known prior to a patient's first PET-CT scan, though an increasing number of scans are performed in patients with known or highly suspected metastatic cancer in which the primary site has not been found, in order to find the origin. Solitary pulmonary nodule evaluations, the first approved indication for PET scans in oncology nearly ten years ago, are particularly helpful in allowing a patient and doctor to relax about a newly discovered lung nodule without having to wait two years to demonstrate stability or resort to biopsy. Up to 60% of suspicious nodules can be accurately characterized as benign with PET-CT — without biopsy. There is a lower limit to the size of a benign lung nodule that can be accurately characterized by PET-CT, usually considered 8 mm.

PET-CT in oncology uses 18F-fluorodeoxyglucose (FDG), a radioactive glucose solution that is injected intravenously for the PET portion of the PET-CT, and is distributed throughout the body to cells that are actively using glucose for energy metabolism. Organs that normally light up on a PET-CT scan include the brain (the “hottest” organ because it is always active and its only source of energy is glucose), heart, liver, kidneys and bladder (the route of excretion of the injected FDG), bone marrow, and spleen. There is variable uptake in any muscle that is used during the first 30 minutes after FDG injection, bowel wall, fat (so-called “brown” fat that makes heat metabolically), breast, salivary glands, thyroid and thymus.

In addition to most cancer cells that use abundant glucose for metabolism because of their rapid growth and division, many actively inflamed tissues and benign reactive processes also accumulate a significant amount of FDG, such that most “hot spots” on a PET-CT scan do not, in fact, represent viable cancer. In the hands of experienced radiologists, though, PET-CT has been proven to be the most accurate method of finding foci of most active cancers anywhere in the body. There are some cancers that typically may not light up on a PET scan, including many mucin-producing tumors, small lymphocytic lymphoma, and a rare form of lung cancer, bronchioloalveolar cell carcinoma.

The other component of a PET-CT scan is the CT. The first hybrid PET-CT unit was introduced in 2000. Prior to that time, PET-only scanners were used, with interpretation made in consideration of findings on CT scans obtained separately on CT units. The CT portion of PET-CT initially was utilized solely to correct for attenuation by the body's dense structures like bone, and to roughly localize the hot spots on a PET scan within a specific organ.

Today, an increasing number of facilities are using PET-CT to obtain a contrast-enhanced diagnostic quality CT scan fused with a state-of-the-art PET scan, obtained at the same time without any patient movement. This maximizes the accuracy of image fusion, eliminates the need for a separate CT scan that exposes the patient to unnecessary radiation and the inconvenience of another imaging study, and provides three sets of images in any plane: diagnostic CT, PET, and fused PET-CT.

There are scores of reputable published studies that have proven the advantages of PET-CT over PET and CT scanning alone in oncology. In lung cancer, for instance, the accuracy of tumor staging has been shown to be 83% with PET-CT compared with 57% with PET alone.

Particularly helpful for evaluation of whether a patient is potentially surgically curable is the high negative predictive value for mediastinal nodes (94%) and the high accuracy of PET-CT in evaluating tumor extension into adjacent structures like the chest wall. Studies also have shown that obtaining separate CT and PET

scans at different times and fusing them is not as accurate as performing PET-CT in an integrated fashion on one unit at the same time, because structures move over time, for example with changes in positioning and respirations.

This advantage of simultaneous PET-CT fusion over PET and CT obtained separately has been perhaps best shown in head and neck cancer, where the ability to accurately identify small lymph nodes

involved by tumor and to characterize normal physiologic activity has been well documented, with PET-CT changing patient management in up to 1/5 of cases. Other studies have highlighted the advantages of PET-CT for esophageal cancer patients receiving pre-operative chemotherapy and radiation therapy, and its use in breast cancer patients undergoing treatment for predicting ultimate response to chemotherapy.

Patient and technologist involvement in PET-CT are more intensive and crucial than in most other diagnostic imaging studies. Patient cooperation is indispensable for an excellent, diagnostic quality PET-CT examination. A specific diet for the 24 hours prior to the scan, adequate control of blood glucose in diabetic patients, alleviation of anxiety, adequate hydration, and most of all, remaining absolutely still, warm and relaxed during the 30 minutes following FDG injection are of paramount importance. Specially trained technologists, dedicated quiet rooms for patient preparation and liberal use of oral mild sedatives are essential.

PET-CT is evolving into a single diagnostic study that accurately evaluates patients with cancer at various stages of their disease process. It is helpful in planning appropriate treatment, and in finding recurrent disease after initial therapy. Performed as a single integrated exam with diagnostic contrast-enhanced CT, it often can eliminate the need for other costly studies and invasive procedures.



## PET-CT RADIATION TREATMENT PLANNING

### A NEW TECHNIQUE NOW AVAILABLE THROUGH A COLLABORATION BETWEEN NORTHWEST HOSPITAL, SWEDISH CANCER INSTITUTE AND VIA RADIOLOGY

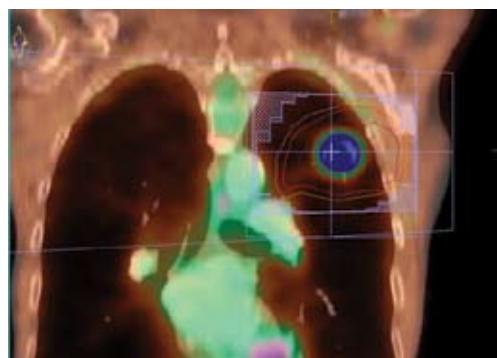
by Daniel M. Landis, MD

The use of PET-CT has been revolutionary in the diagnosis and staging of many types of cancers. The PET scanner provides valuable physiological data on the cellular activity of a tumor, while the CT scanner provides anatomical data much like a map. Together, the combined images act as a road map which can help to both identify and pinpoint the precise location of tumors.

However, now PET-CT can be used not only for diagnostic purposes but in radiation planning with our new dedicated PET-CT radiation treatment planning system. Previously, radiation oncologists would overlay information from a PET and CT scan with a separate radiation therapy planning scan, usually performed days apart and often in different anatomic positions. With this new technology, the hybrid PET-CT can be performed in the exact position used each day for radiation therapy.

We know from recent publications that the accuracy of the radiation therapy plan is greatly improved when incorporating PET-CT into that data instead of just CT alone. There were several papers presented at the Radiation Therapy Oncology Group (RTOG) that showed images of the treatment plan using CT and then showed images of the treatment plan using PET-CT. The

area of the tumor that was treated was grossly different between the two treatment plans. Other studies showed decreased doses to normal surrounding structures such as the lung and esophagus with PET-CT treatment planning. Therefore, we believe PET-CT is going to have a huge impact on radiation therapy. Research on using this modality for lung cancers, head and neck cancers, cervical cancer, esophageal cancer, and other cancers is ongoing. However, thus far it is clear that this technique can reduce radiation exposure to normal organs, while safely allowing significant escalation of radiation dose.



## BREAST MRI FOR BREAST CANCER DIAGNOSIS

by Katherine E. Dee, MD & Craig C. Hanson, MD

In the last few years, breast MRI has rapidly assumed a crucial role in breast cancer diagnosis. The scanners have become faster, software has been developed for complex analysis of the images and biopsy technology is now available that is compatible with the strong magnetic fields used for MR imaging. The Seattle Breast Center at Northwest Hospital & Medical Center currently performs around 500 breast MRI exams per year, and volumes are growing.

The most common reason for performing breast MRI is a new breast cancer diagnosis. Breast MRI can further define the extent of disease before surgery, especially if the woman has dense breasts. The goal is to find all of the cancer so that only one surgery is necessary. Studies comparing mammography, ultrasound and MRI have shown MRI to be superior to the other two modalities in determining the size of the primary tumor and in identifying additional sites of malignancy. Breast MRI has been shown to change surgical management in 7% to 51% of cases. One published study has shown a significant reduction in the local recurrence rate in women who are evaluated pre-operatively with MRI.

As more women undergo neoadjuvant chemotherapy, MRI has shown its superiority in monitoring the response to therapy.

Other indications for breast MRI include detection of local recurrence after breast conservation, identification of an occult breast primary in a patient presenting with axillary lymphadenopathy, and the occasional problem-solving exam when the mammogram and ultrasound are negative.

Breast MRI is also increasingly used for breast cancer screening in high-risk women. Breast MRI is extremely sensitive in the detection of breast cancer, with sensitivities approaching 100% for invasive cancers as small as 3 mm. Eight clinical trials have been published showing its efficacy in screening high-risk women. Screening with mammography *and* breast MRI has also been shown to increase the sensitivity for breast cancer from 31% to 100% over mammography alone. This results in an additional cancer yield of eight to 67 cancers found per 1000 women screened. (For comparison, there are three to six cancers detected per 1000 women screened for mammography in the general population.) Women considered to be at high risk include those with a personal history of breast cancer; known genetic mutations (BRCA1/BRCA2) or a strong family history (first degree relatives with pre-menopausal diagnosis); and women who have received radiation to the chest.

Because each breast MRI exam generates around 2000 images, and because there is a large amount of post-processing necessary to create and evaluate these images, software has been developed to automate processing and provide complex display and analysis tools for exam interpretation. This has made the processing much more rapid and the image analysis more robust. We can now evaluate the enhancement characteristics of every pixel in the breast, whereas before the advent of these tools, each region of interest had to be evaluated manually. This not only speeds up the interpretation time, but it increases our sensitivity for breast cancers. The software also provides data on volume and enhancement parameters of known cancers, offering an objective measurement to follow during neoadjuvant chemotherapy.

Lastly, new MRI-compatible vacuum-assisted biopsy devices and biopsy-guidance systems have been developed to allow MRI-guided core needle biopsy of lesions detected only by MRI. This ability

is critical to any successful breast MRI program. The Seattle Breast Center was the first nonacademic facility in the Northwest to offer this service.



In summary, breast MRI has become an extremely valuable tool in the diagnosis of breast cancer, both in the screening and diagnostic settings. New technologies, including both hardware and software, have markedly improved the speed, accuracy and utility of breast MRI examinations.

## LYMPHEDEMA UPDATE

*by Jean Fritz, OTR/L*

On June 24, 2006, Northwest Hospital's lymphedema team partnered with members from Cancer Lifeline to host the first "Understanding Lymphedema" conference, luncheon and fashion show. More than 100 individuals participated in this event, some from as far away as Tacoma, Olympia and Vancouver, BC.

Jan Grey, CEO of Cancer Lifeline, opened the event. Northwest Hospital's Charlene Kaiser, a LANA-certified lymphedema therapist, spoke about what causes lymphedema, its symptoms, prevention and therapeutic management strategies. Following this overview, a panel of five women who have lymphedema spoke about the practical aspects of living with the condition. Participants also had the opportunity to ask questions of a panel of lymphedema experts. Questions ranged from the types of compression garments used for airline travel, to techniques for managing scar tissue following lymph node removal, to dealing with injections, blood draws and IVs with bilateral lymphedema.

During lunch, attendees enjoyed a fashion show presented by Talbot's, University Village. The models were women who suffer from lymphedema. Following the lunch and fashion show, attendees were treated to a "Focus on Healing" session featuring the Lebed Method of exercise to facilitate lymphatic flow. At the conclusion of the event, participants were asked to write a "gem" of the day to share with the audience. Gems were defined as things audience members learned or what new or different things they planned to do to help manage their lymphedema as a result of the conference.

Attendee feedback about the conference was overwhelmingly positive. Participants reported that the information presented in the conference was appropriate, understandable and functional. They also commented on the fun, positive atmosphere of the event, and that it allowed them to connect with others who have lymphedema and with professionals in the field.

### GEMS OF THE DAY - Quotes from participants at the "2006 Understanding Lymphedema" Conference:

"I learned to take the management of my lymphedema seriously. I learned that others cope with it . . . I can too!"

"It was an inspiration! The speakers, blowing bubbles and dancing with others who have been through what I've been through. I loved this day – I almost cried because it made me so happy."

"I have had lymphedema for 18 years and never had any assistance. I learned so much today – exercise, treatment, information that I was never given. Today's program has changed much of my thinking for the better. I guess it's never too late. Thank you so much for this program."



# CANCER REGISTRY UPDATE

by Brad Nadir, CIS

Under the guidance of the Cancer Committee, the Northwest Hospital Cancer Registry continues to maintain data on each patient's type of cancer, course of treatment, response to treatment and medical status for the patient's lifetime. Registry data are available for clinical studies on an ad hoc basis.

2006 was a dynamic period for the Cancer Registry. Cancer registrar Kim Baldwin, CTR, left her position to become a consultant and ad hoc mentor to new Cancer Registry coordinator, Brad Nadir, CIS. Nadir is a long-term NWH employee who was previously a member of the Information Management Services team. Nadir has also enjoyed a long career as a registered nurse in critical care, a registered respiratory therapist, a database developer and a clinical researcher. As Cancer Registry coordinator, he will focus on optimizing the NWH Cancer Registry database with the goal of utilization for clinical research. To achieve this, considerable effort has been put into laying the groundwork for the conversion of the current Cancer Registry software, "Oncolog," to the much more efficient "CNeXT" platform. Members of Northwest's Decision Support department have been instrumental in facilitating this conversion.

Newly developed database techniques employed in the Cancer Registry operations have resulted in a staging form placement rate of virtually 100% in charts of analytic cases. ACoS Standard 4.3 requires that the placed forms be completed in at least 90% of these cases.

In 2005 the top five cancer sites at Northwest Hospital in order of accession were breast, lung, prostate, colon and bladder. The 2006 cases are currently being accessioned.

Cancer Site	1997	1998	1999	2000	2001	2002	2003	2004	2005
Bladder	31	34	32	31	43	39	28	30	22
Breast	162	162	160	154	150	118	141	125	127
Cervix	2	4	5	2	1	4	3	3	3
Colon/Rectum	75	75	63	66	55	80	72	61	43
Kidney	13	13	13	18	14	21	18	16	17
Lung	72	87	85	85	74	81	86	82	75
Ovary	13	13	15	9	12	8	6	5	8
Prostate	339	329	348	241	177	138	35	42	41
Uterus	21	23	15	21	19	14	16	10	14
Other Sites	160	174	166	137	139	106	160	184	154
<b>Total Sites</b>	<b>888</b>	<b>914</b>	<b>902</b>	<b>764</b>	<b>684</b>	<b>609</b>	<b>565</b>	<b>558</b>	<b>504</b>

\*The associated table reflects 2005 accessions into the NWH Cancer Registry and does not reflect the incidence of specific cancers in the community. The incidence of specific cancer sites reflected in the table is more profoundly affected by the entry and departure of specialists and programs at NWH that are dedicated to particular cancer sites. The cancer sites displayed on the table are pre-selected, historically followed sites and do not necessarily represent the top nine sites of any given year.

# BREAST CANCER SURVIVAL STUDY

by David E. Dong, MD

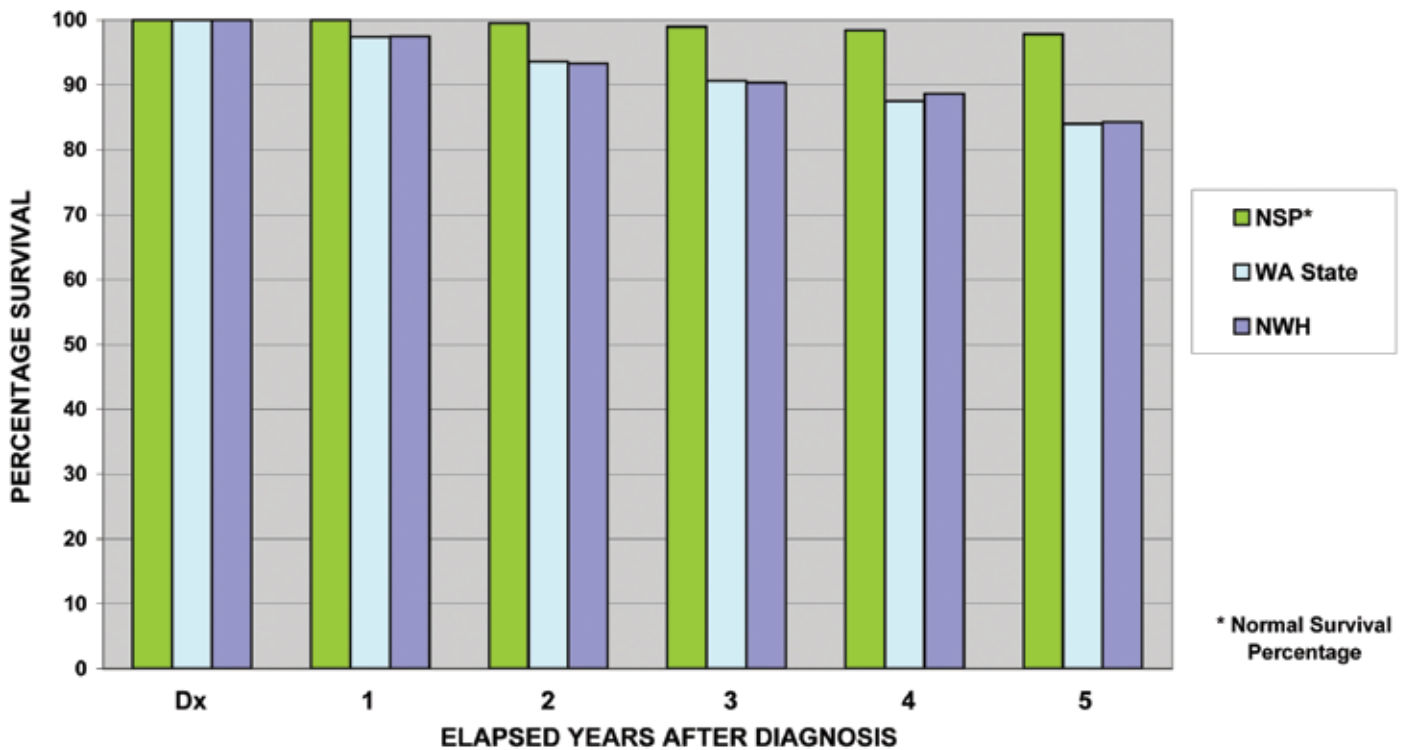
Breast cancer continues to be an increasingly common diagnosis for women in this country. It is reported to occur in one in eight women. It is of particular concern that treatment for patients continues to meet community and academic standards. Treatment for breast cancer continues to be a rapidly changing field with new innovations occurring annually.

Northwest Hospital has continued to be a leader in the field of breast cancer therapy in the community. We were among the first to implement sentinel node sampling with information documenting quality of care and the benefits of sampling with decreased side effects. Northwest Hospital was also the first and remains one of the few facilities to offer MRI-guided needle biopsy for difficult-to-identify tumors. We also continue to practice and pioneer neoadjuvant therapy for identifying chemotherapy responsive tumors. Results are currently pending from a recent investigative study fingerprinting or gene profiling breast cancers to better determine ideal chemotherapy treatments for future patients.. Through these and other care and research studies, Northwest Hospital and the Seattle Breast Center continue to provide excellent diagnosis and treatment.

The current comparative study with community cancer centers is provided below. Data is available for patients in the current community registry for 1998 and 1999. Data presented for overall survival continues to be equal to other community cancer centers for treatment outcomes.

## BREAST CANCERS DIAGNOSED IN 1998 AND 1999

Includes All Histology Codes



# RADIOFREQUENCY ABLATION

by Ray S. Jensen, MD

Many methods of minimally invasive therapy have been tried in recent years to treat tumors in organs such as the liver. One of the most promising is called radiofrequency ablation, sometimes referred to as RFA.

In RFA, a small metal tube (probe) is inserted directly into the tumor. Once in place, energy is delivered through the probe and into the tumor. Because the energy is in the radiofrequency spectrum, it is called radiofrequency ablation. The radiofrequency energy causes atoms in the tumor to vibrate, creating friction and causing the temperature within the tumor to rise. Healthy tissue generally can withstand more heat than tumor cells. Therefore, RFA is often able to destroy the tumor without significantly damaging surrounding structures. The heat from radiofrequency energy also closes up small blood vessels, thereby minimizing the risk of bleeding. The dead tumor cells are gradually replaced by scar tissue that shrinks over time.

RFA may be done by placing ablation needles through the skin (percutaneously), by placing needles through a tube inserted through small holes in the skin (laparoscopy), or during open surgery. Most interventional radiologists prefer the percutaneous approach because it is felt to be much less invasive. When using the percutaneous approach, the probe is placed under the guidance of an imaging method such as ultrasound or computed tomography (CT)



## HIGH TECH AND HIGH TOUCH: NURSING SERVICES BRIDGE THE GAP

Mary Jo Sarver, MN, ARNP, AOCN

Mr. X (named withheld for patient privacy) is a 52 year-old construction worker who recently received a diagnosis of Non Small Cell Lung Cancer (NSCLC). Just two weeks ago he thought he was battling pneumonia and chronic bronchitis. He has smoked since he was 20 years old but otherwise states he has a healthy lifestyle and “hasn’t been sick a day in his life”. He lives with his wife of 29 years and their two sons, ages 15 and 17. His only experience with cancer was as a teenager, watching his father die from NSCLC.

Today people are surviving much longer because technologies that not only assist in diagnosis of cancer but also in staging and

scanning. This real-time guidance allows the interventional radiologist to assure proper placement of the probe.

Radiofrequency tumor ablation has been performed in various tissues of the body, including bone, kidney, lung, liver and prostate. The most frequent site is the liver.

Two types of liver tumors have been the main targets of RFA: primary liver cancer (hepatocellular carcinoma), and metastatic liver cancer. Traditionally, surgical resection has been the only treatment option for patients with tumors of the liver. Many patients with malignant liver tumors, however, are not good candidates for surgery. This can be because their tumor is too widespread, because of other medical conditions that make surgery especially risky, or because too much liver tissue would have to be removed with the tumor. For many of these patients, RFA is a viable and effective treatment option.

Some liver tumors that have failed to respond to chemotherapy or have recurred after initial surgery may be treated by RFA. If there are multiple tumor nodules, they may be treated in one or more sessions. In some cases RFA has made it possible to operate on a patient after eliminating several small liver tumors that were too spread out to remove surgically. In general, RFA is most effective if the tumor(s) is less than four centimeters (about two inches) in diameter. Although RFA can be used to treat larger tumors, the results are not as effective. Typically RFA is not used to treat liver tumors if there is active cancer outside of the liver.

Cancer is a complex and tenacious disease. Over the years, many treatments have been developed and utilized. Radiofrequency ablation is proving to be another useful tool in the ongoing fight against this disease.

treatment planning, have increased at a surprising rate. Although the technological progress has been amazing, the focus now is on how to coordinate seamless care from specialty to specialty, assist patients in navigation of multiple systems and still maintain the human touch and emotional support necessary to help patients and families in times of a healthcare crisis.

For example, what are the needs of Mr. X? Within a short time-frame his list of needs would consist of many of the following: PET-CT scan, pulmonary function testing, labs, radiation therapy consult, medical oncology consult, surgery consult, surgical or

radiological biopsy with pathology reporting, MRI, etc. All this information is needed just to determine the best treatment plan from a medical perspective. But what about his job, his ability to work or get time off for testing, his family's needs, potential decreased income, maintaining insurance, and past experience that makes him fear dying as he is waiting for testing and results?

Nurses today are the link and the lifeline for many patients. They educate and assist patients and families by explaining procedure preparation and discharge directions, assessing immediate and long term needs, referring to multiple community resources, providing emotional support and collaborating with multiple disciplines in order to support the physician's plan of care – all while helping maintain hope at the bedside.

## GARDASIL

*by Patricia A. Rodrigues, MD*

In the fall of 2006 the FDA approved Gardasil™, the first vaccine developed to prevent cancer. Gardasil™ protects against human papillomavirus (HPV) infection, which is a prerequisite to the development of cervical cancer in the majority of cases.

The American Cancer Society estimates 11,150 women this year alone will be diagnosed with invasive cervical cancer in the United States, and approximately 3700 will die of the disease. Most cervical cancers are caused by HPV infections, with 70% of cases in this country associated with types 16 and 18. In addition, 500,000 precancerous lesions are diagnosed each year, 50-60% of which are related to HPV 16 and 18 infections.

To date, cervical cytology screening and treatment of precancerous lesions (also called dysplasia) have been the only weapons to combat cervical cancer. These programs are generally effective; however, even in developed nations screening is not universal. In 2003 only 67% of women aged 18 – 64 who were uninsured received adequate screening in the preceding three years compared to 86% of insured women.

The present recommendation is that HPV vaccine be administered to 11-12 year old girls as part of the routine immunization schedule. The FDA has approved vaccine use for women and girls age 9-26. Ideally, completing the vaccine series prior to the onset of sexual activity would accomplish the greatest reduction in new HPV infections. The potential impact of vaccination on decreasing cancer rates will only occur if the vast majority of the population at risk is immunized. Vaccine can be given to women who have already been sexually active and even to those with a previous history of cervical dysplasia.

Gardasil™ is administered as a series of three shots over a six-month period. It is not recommended for use by pregnant women or those intending to become pregnant in the next six months. The side effects of the vaccine have been minimal and mainly relate to local discomfort at the injection site.

Mr. X received all the necessary testing and education, and through his interactions with nurses, his own personal needs were met as well. He was enrolled in a smoking cessation program and received counseling with his wife to address the guilt he felt for having exposed his family to second-hand smoke for so many years. He was assisted with a living will so his wife and sons would not need to make tough decisions. Finally, he and his family enrolled in a support group and were able to connect with others in the same or similar situation.

While technological advances have allowed us to diagnose and treat our patients faster and with more accuracy, the commitment and caring of nurses at the bedside also allow us to continue to treat our patients with dignity, compassion and humanity.

It should be noted that the vaccine is not a treatment for cervical dysplasia or cancer. It will also be necessary to continue regular cervical cancer screening programs (the traditional Pap smear), even in women who have been vaccinated. The long term impact of HPV vaccination on the rate of cervical cancer is not expected to be demonstrable until the population presently being immunized reaches the age of 48. This is the median age at which cervical cancer is diagnosed in the US. Decreasing the rates of abnormal Pap smears requiring evaluation and treatment will also positively impact women.

The availability of HPV vaccine is a significant innovation in women's health. Clearly it is far better to prevent the development of any disease rather than seek to minimize its impact once it occurs.

The vaccine is covered by many but not all insurers at this time. It is recommended that women interested in vaccination contact their health care providers. The physicians at Meridian Women's Health are accepting new patients for vaccination.



# IMMUNOHISTOCHEMISTRY: A POWERFUL TOOL FOR CANCER DIAGNOSIS AND THERAPY

by Paul F. Edmonson, MD, PhD

Throughout its history, diagnostic surgical pathology has been grounded upon microscopic examination of tissue sections. For the most part, this has been accomplished with a small number of routine stains, most notably the H&E (hematoxylin and eosin) stain. The vast majority of microscopic diagnoses have been, and continue to be made, by this simple and straightforward technique that has proven very robust and versatile, being the international standard for more than 100 years. However, in many cases morphologic evaluation alone does not provide sufficient discriminatory power to precisely identify and characterize tissue samples.

Immunohistochemistry (IHC) is a technique that combines the broad strengths of histology with the high specificity of antibody reagents directed against individual cellular antigens. By virtue of this specificity, IHC removes much of the subjectivity inherent in histologic examination. IHC is now used routinely by pathologists alongside traditional histologic examination, and has had its greatest application as an aid in characterizing malignant tumors. It permits pathologists to characterize tumors with greater precision and with greater levels of certainty, thus contributing to better patient care.

Beyond tumor identification, IHC continues to provide prognostic information with regard to tumor behavior and response to various chemotherapeutic agents. Well known examples for breast carcinoma include determination of estrogen and progesterone receptor expression (response to hormone suppression), and of the Her-2/neu oncogene protein product, a negative prognostic indicator and also predictive of response to doxorubicin.

More recently IHC has taken on a crucial role in predicting responses of certain carcinomas, soft-tissue tumors, leukemias, and lymphomas to specific targeted therapies. These targeted agents are directed against specific proteins on the surfaces of tumor

cells, and may incorporate monoclonal antibodies or rationally designed enzyme antagonists. Efficacy of these therapeutics is largely dependent upon tumor expression of the target antigens. By using IHC to measure a tumor's expression of the target antigen, therapy planning can be improved by knowing ahead of time whether an individual patient is likely to respond to a given targeted agent before subjecting that patient to potential side-effects. Importantly, this also provides an opportunity to select potentially more efficacious chemotherapy if the IHC indicates a low probability of response. This approach has been used both in adjuvant and neoadjuvant settings.

The best known example of IHC predicting response to targeted therapy is the measurement of the Her-2/neu oncogene protein product expression on the surface of breast carcinoma cells as a predictor of response to Herceptin. Herceptin is only FDA approved for use with breast carcinomas that over-express the Her-2/neu oncogene protein product (or demonstrate gene amplification by fluorescence in situ hybridization). Similarly, use of Erbitux is approved by the FDA for colon carcinomas that over-express the epidermal growth factor receptor (EGFR) as a predictor of tumor response. In gastrointestinal stromal tumors expression of the CD117 molecule is predictive of response to Gleevec, and response of B-cell lymphomas to Rituxan is predicted by expression of the CD20 molecule.

An additional strength of IHC is that it can be applied to archived specimens to address initially unforeseen questions, such as whether a later malignancy represents recurrence of a prior lesion or a new primary, or predicting response to newly developed therapies. IHC continues to stand as one of the most powerful and cost-effective techniques available to pathologists with regard to tumor classification. It provides surgeons and oncologists with information essential to considering patient prognosis, therapy planning and potential response to therapy.



# TARGETED THERAPY - ANOTHER OPTION

by David E. Dong, MD

Dr. Brian Drucker was a new scientist at Oregon Health & Science University and interested in new drugs. STI-571 was just another drug that had failed initial evaluation and was sitting on the shelf. It sparked an interest in Dr. Drucker to further investigate this drug's mechanism in leukemia. The FDA fast-tracked its approval in May 2004 for the treatment of chronic myelogenous leukemia (CML), which once had a median chronic phase of three years before progressing to advanced disease and then acute leukemia. Gleevec (Imatinib) appears to affect the known gene translocation at the BCR-ABL gene with the classic translocation (9, 22). This opened up the first wave of targeted therapy aimed at the inhibition of the target, tyrosine kinase (TK) pathways. What once required a bone marrow transplant for possible cure now can be forestalled up to ten years or longer with newer generation TK pathway inhibitors (TKI). Refractory CML has found benefit in second generation TKIs such as Sprycel (Dasatinib). There are hundreds of TK inhibitors currently in clinical trials and drug company development.

Many normal tissues use the TK pathway for regulation of cell growth and development. What seems to happen in cancer is the alteration of these pathways that allow cell regulation escape. Unfortunately, it has not been as simple as portrayed. There are many TK pathways along with other pathways that tumors seem to utilize, not all of which have been characterized as yet. Different approaches to inhibition or blockage of known pathways have led to many new drugs in the class of "targeted therapies."

Herceptin (trastuzumab), a monoclonal antibody (MA) to the EGFR2, or HER2 receptor, has had dramatic influence in the treatment of HER2 positive breast cancer patients. Contrary to many of the oral TKIs (e.g. Tarceva [Erlotinib]) that is internalized and acts within the cell, Herceptin acts by inhibiting the surface antigen on the cells expressing the HER2 antigen. Dramatic improvements in time-to-relapse in early stage breast cancer patients and response in refractory patients has changed the landscape of therapy for HER2 positive breast cancer patients. Lapatinib (Tykerb), an oral multi-TKI affecting HER1 and HER2, recently was approved by the FDA with similar exciting benefits in breast cancer patients.

A similarly impressive impact has been seen with the use of another MA, Avastin (Bevacizumab). Avastin works by clearing up blood vessel supply to tumors. Bevacizumab was initially approved for application in advanced stage colon cancer, improving survival in patients in combination with traditional chemotherapy. Broader application in other diseases has provided similarly impressive benefits, in particular advanced breast and lung cancer. Its application has also opened new territories in treatment of brain tumors, a particularly difficult tumor type to treat. Similarly, MAs have also been developed to attack the EGFR1 antigen, compared to their oral counterpart, Tarceva. Erbitux (Cetuximab) has shown improvement in survival for refractory patients with

colorectal cancer. Further investigation in other applications, such as head and neck cancers and lung cancer, are under study.

The use of TKIs and MAs has opened a new venue for cancer treatment. There are hundreds of TKIs and antibodies actively being studied, in addition to looking at other aspects of cellular growth that may be new targets at which to aim. Sutent (Sunitinib) and Nexavar (Sorafenib) were recently approved for the treatment of advanced renal cell cancer. Both of these drugs affect several TKI pathways in combination. Temsirolimus, an m-Tor inhibitor, is another promising agent pending approval for renal cell cancer.

Combination therapy with traditional chemotherapy and TKIs or MA has not been as promising as hoped. The use of Herceptin and Avastin has had impressive results in combination with chemotherapy, but less beneficial effects independently. Studies are underway to better define optimal application of these new medications. Questions of pre-chemo, post-chemo or sequential applications are still being investigated. Similarly, combining various target agents at different pathways is also being investigated. Overall, as in any new field, extensive studies are required to best determine optimum benefit, side effects, and cost effectiveness.

Although new drugs offer clear benefits, there is always the flip side of the coin: side effects and toxicities. The most common side effects of all TKIs or MAs are rash and diarrhea. These can be mild to moderate, requiring no intervention, or easily treated by over-the-counter medications. More severe side effects requiring hospitalization or allergic reactions are rare.

Not all drugs in development have met with success. Iressa (Gefitinib) was approved for use in refractory non-small cell lung cancer by the FDA, conditional upon its final trial results showing an improvement in overall survival. Unfortunately, the improvement was not supported by the final outcome and the drug was removed from the market. A very similar medication with increased potency, Tarceva, was able to show benefit based upon improvement on disease-free survival and quality of life, and is currently available for use in refractory lung cancers. Both Iressa and Tarceva presumably function by internalization into the cell and directly inhibiting the Epidermal Growth Factor Receptor 1 (EGFR1).

The best advice to cancer patients is to talk to their doctors to see if there is a trial of targeted medication that may be available and approved for treatment of their particular cancer. Patients should be aware that given the investigative nature of some of these medications, they should consider participation in a clinical trial that offers the safest and best means of evaluating these medications for safety, efficiency and toxicities. Hopefully, treating one's cancer as a chronic disease like high blood pressure or diabetes can become a continuing reality.

## 2005 NEW CANCER CASES: SITE DISTRIBUTION REPORT

PRIMARY SITE	TOTAL	SEX		CLASS		DOMINANT AJCC STAGE GROUP						
		Male	Female	Analyt	Nonan	0	I	II	III	IV	None	Unknown
Oral	2	2	0	2	0	0	0	0	0	2	0	0
Esophagus	5	4	1	4	1	0	1	0	1	1	0	2
Stomach	5	1	4	5	0	0	0	0	0	1	0	4
Colon	33	11	22	33	0	0	15	3	5	8	0	2
Rectum	10	6	4	10	0	0	4	1	2	2	0	1
Liver/Biliar	6	5	1	6	0	0	1	0	1	2	0	2
Pancreas	9	3	6	9	0	0	0	0	2	6	0	1
Larynx	2	2	0	2	0	1	0	0	0	0	0	1
Lung	75	32	43	75	0	0	13	3	17	34	0	8
Connective	3	1	2	3	0	0	0	1	0	1	0	1
Skin/Melanoma	3	2	1	3	0	1	0	0	0	0	0	2
Breast	127	3	124	127	0	29	50	19	9	9	1	10
Cervix Uteri	3	0	3	3	0	2	0	0	0	0	0	1
Corups Uteri	14	0	14	14	0	0	7	1	3	0	0	3
Ovary	8	0	8	8	0	0	1	1	1	2	0	3
Prostate	41	41	0	41	0	0	0	30	1	5	0	5
Testis	3	3	0	3	0	0	1	1	1	0	0	0
Bladder	22	14	8	22	0	12	3	4	0	1	1	1
Kidney/Other	17	11	6	17	0	0	8	2	2	3	0	2
Brain/CNS	36	14	22	36	0	0	0	0	0	0	36	0
Thyroid	2	1	1	2	0	0	1	0	0	0	0	1
Leukemia	10	5	5	10	0	0	0	0	0	0	10	0
Lymphoma	20	15	5	20	0	0	4	1	2	9	0	4
Other	60	27	33	60	0	2	3	1	1	3	46	4
<b>Total</b>	<b>516</b>	<b>203</b>	<b>313</b>	<b>515</b>	<b>1</b>	<b>47</b>	<b>112</b>	<b>68</b>	<b>48</b>	<b>89</b>	<b>94</b>	<b>58</b>

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STAGE OF DISEASE: The extent to which the tumor has progressed as indicated by all diagnostic and therapeutic evidence obtained during the time of the first course of treatment. The cancer Registry records stage and anatomic extent of disease for all tumors using the AJCC TNM staging guide.

N/A: certain tumors, including carcinoid tumors, non-malignant brain tumors, and GI NOS have no staging assigned but are followed as analytic cases in the registry.





NORTHWEST HOSPITAL  
& MEDICAL CENTER

1550 North 115<sup>th</sup> Street | Seattle, WA 98133  
(206) 364-0500 | [www.nwhospital.org](http://www.nwhospital.org)