The Robert H. Lurie Comprehensive Cancer Center of Northwestern University at Northwestern Memorial Hospital
Recognized as a national leader in cancer care, the Robert H. Lurie Comprehensive Cancer Center of Northwestern University at Northwestern Memorial Hospital is committed to providing sophisticated treatment in a compassionate environment. The Lurie Cancer Center treats patients with a full spectrum of cancers and is noted for its broad scope of research, distinguished staff, a world-class teaching program and promising new therapies in oncology and hematology.

This report highlights the Lurie Cancer Center’s 2008 efforts and focuses specifically on its advances in the treatment of head and neck cancers, which affect more than 50,000 Americans every year. We also celebrate the recruitment of many talented new staff members, including seven distinguished researchers and clinicians who will provide additional depth to our program, with highlights on page 6.

Among our accomplishments in 2008:

• The Lurie Cancer Center successfully renewed its five-year designation as a Comprehensive Cancer Center by the National Cancer Institute (NCI), making it one of only two programs in Illinois and 41 nationally to hold this prestigious title. NCI Comprehensive Cancer Centers are recognized for their scientific excellence and extensive resources focused on cancer and cancer-related problems.

• We also became home to the Partnership Program staff for the Heartland Region of the NCI’s Cancer Information Service, a national information and education network. The Lurie Cancer Center remains the only Illinois program in the 21-member National Comprehensive Cancer Network.

• The Stem Cell Transplant Program continued to provide innovative care for patients and advance medical research. The program is a national leader in both the volume and types of transplants performed, achieving survival rates that consistently exceed the national average. In fiscal year 2008, 264 stem cell transplants were performed.

• The annual Cancer Survivors’ Celebration and Walk, sponsored by the Lurie Cancer Center, drew 4,000 supporters to Chicago’s Grant Park, including more than 700 cancer survivors.

• Patients benefited from our unique Psychosocial Oncology Program, a multifaceted approach designed to deliver exceptional cancer treatment but also to address each patient’s psychological, social and emotional needs.

Our thanks to the medical staff for the exceptional care they provide. We are proud to recognize all of their exciting achievements over the past year.

William Small, Jr., MD
Chair of the Committee on Cancer Northwestern Memorial Hospital

Steven T. Rosen, MD
Director of the Robert H. Lurie Comprehensive Cancer Center of Northwestern University at Northwestern Memorial Hospital
Exploring Advanced Therapies for Head and Neck Cancers

Each year, more than 50,000 Americans develop cancers of the head and neck and nearly 13,000 die, according to the U.S. Department of Health and Human Services. Working collaboratively, Northwestern Memorial Hospital, Northwestern University’s Feinberg School of Medicine and the Robert H. Lurie Comprehensive Cancer Center of Northwestern University are advancing early detection, leading-edge treatment and clinical and scientific research to positively impact survival rates.

Refined Assessment and Treatment Plans

As one of only 41 cancer centers in the nation to hold the National Cancer Institute’s “comprehensive” designation, the Lurie Cancer Center brings highly qualified teams of specialists and state-of-the-art technology to patient care.

“Our team approach provides each patient with a treatment plan tailored to the particular type and stage of cancer as well as any individual health concerns,” says Mark Agulnik, MD, a hematologist/oncologist on the medical staff at Northwestern Memorial and assistant professor of Hematology and Oncology at the Feinberg School.

Patients may be directed to undergo screenings including endoscopy, laboratory testing, magnetic resonance imaging (MRI), biopsy or a computed tomography (CT) scan. Before any treatment begins, each patient’s case is studied by a multidisciplinary team of specialists including:

- Radiologists
- Radiation Oncologists
- Dentists
- Pathologists
- Surgeons
- Medical Oncologists
- Speech Pathologists

These specialists work together to assess each patient’s condition and to develop a treatment plan designed to achieve optimal cancer control and improve chances of survival.

Improved Surgical Precision

Surgery remains a primary treatment for many head and neck cancers and in advanced cases is combined with concurrent chemotherapy and radiation. Specialists at the Lurie Cancer Center seek new options in surgery and treatment that focus on organ preservation. For example, laryngectomy once was standard procedure for patients diagnosed with cancer of the larynx. Some patients now are able to receive modified surgery in which a portion of the larynx is removed and the remaining tissue is treated with chemotherapy and radiation.

“This approach preserves laryngeal tissue and can allow the patient to maintain some laryngeal function,” says Harold J. Pelzer, DDS, MD, chief of Head and Neck Surgery at Northwestern Memorial and vice chair of Otolaryngology at the Feinberg School.

Surgeons at Northwestern Memorial also adopted cryosurgery in 2008 as a palliative treatment for select patients with persistent, nonresectable cancer whose disease has not responded to standard therapies. During cryosurgery, a probe dosed with liquid nitrogen “freezes” the tumor to inhibit its growth. The treatment is not a cure but can mitigate or control symptoms such as pain and hemorrhaging. “Cryosurgery can slow the progression of the disease and make a major difference in the quality of life for some cancer patients,” says Dr. Pelzer.
Increasingly, physicians at Northwestern Memorial are turning to sophisticated, minimally invasive surgical options for head and neck cancers. Transoral laser surgery, for example, is used to treat throat and larynx cancer, according to Urjeet A. Patel, MD, an otolaryngologist on the medical staff at Northwestern Memorial and assistant professor of Otolaryngology at the Feinberg School. During the procedure, lasers and special retractors are used in removing the tumors. “Not so long ago, we would have had to open the neck and throat to operate,” Dr. Patel says. “Now these new, minimally invasive procedures are just as effective in removing the cancer with fewer complications and faster recovery.”

Patients with nose and sinus cancers also can benefit from a minimally invasive procedure in which sinus surgeons partner with oncologists, using sophisticated surgical tools to remove these cancers through the nostril rather than creating external incisions in the face. The approach results in faster recovery and minimal visible scar tissue. “We continue to explore and incorporate new options in minimally invasive surgery whenever possible,” says Dr. Patel.

**Intensity-Modulated Radiation Therapy**

One of the most important breakthroughs in the treatment of head and neck cancer has been the introduction of intensity-modulated radiation therapy (IMRT), an advanced method of high-precision radiotherapy, according to Bharat B. Mittal, MD, chairman of Radiation Oncology at Northwestern Memorial and professor of Radiation Oncology at the Feinberg School. As one of the most common forms of treatment for thyroid, throat, mouth and sinus cancers, IMRT uses computer-controlled X-ray accelerators to deliver precise radiation doses to a malignant tumor or specific areas within the tumor.

IMRT allows for the radiation dose to conform more precisely to the three-dimensional (3-D) shape of the tumor by modulating the intensity of the radiation beam. Treatment is carefully planned using 3-D CT images of the patient in conjunction with computerized dose calculations to determine the dose intensity pattern that will best conform to the tumor shape.

“**BY POTENTIALLY REDUCING OVERALL TREATMENT TOXICITY AND SIDE EFFECTS OF THE CANCER TREATMENT, WE CAN ACHIEVE A BETTER QUALITY OF LIFE.**”

— Bharat B. Mittal, MD

With IMRT, higher and more effective radiation doses can safely be delivered to tumors with fewer side effects compared with conventional radiotherapy techniques. “IMRT has really been a breakthrough in cancer treatment,” Dr. Mittal says. “By potentially reducing overall treatment toxicity and side effects of the cancer treatment, we can achieve a better quality of life.”

Dr. Mittal is co-principal investigator of a study funded by the National Institutes of Health that explores the full potential of IMRT in head and neck cancers. Image-guided radiation therapy (IGRT) is another advanced type of treatment at the Lurie Cancer Center. Just as organs can shift in the body, tumors can shift position as well. IGRT uses various imaging technologies to find the precise location of a tumor prior to radiation therapy. As with IMRT, this process improves treatment accuracy so the amount of healthy tissue exposed to radiation can be reduced.
Chemotherapy and Chemoradiotherapy

Chemoradiotherapy—a procedure in which chemotherapy and radiation are administered simultaneously—is the gold standard of treatment for head and neck cancers, according to Steven B. Newman, MD, a hematologist/oncologist on the medical staff at Northwestern Memorial and assistant professor of Hematology and Oncology at the Feinberg School. “Administering chemotherapy and radiation together increases the effectiveness of the radiation, often resulting in better survival rates,” he says.

Physicians also are prescribing Erbitux® (cetuximab), a monoclonal antibody for the treatment of head and neck cancers. Erbitux is shown in recent studies to improve survival rates in patients with locoregionally advanced disease of the head and neck when used in combination with radiation therapy. As well, the drug is used as a single agent for patients with recurrent or metastatic disease.

The Northwestern Brain Tumor Institute

Established in 2008, the Northwestern Brain Tumor Institute is a collaboration of researchers and clinicians united by a common goal, to find a cure for brain and spinal tumors. A multidisciplinary approach combines state-of-the-art technologies and aggressive research with a range of treatment options. Staff are working to build a comprehensive, premier program in neuro-oncology that will help to set national standards for patient care and research. The Brain Tumor Institute is a partnership among the Lurie Cancer Center, the Feinberg School and Northwestern Memorial.

Better outcomes for thyroid cancer patients

Thyroid nodules, a possible symptom of cancer, appear in up to 50 percent of Americans by age 50. They increase in frequency with age and are more common in women than in men. The overall risk of malignancy in a thyroid nodule is about 5 percent.

The incidence of thyroid cancer has been growing over the past decade. The National Institutes of Health (NIH) estimated that more than 37,000 Americans would be diagnosed with thyroid cancer in 2008. However, the growing sophistication of imaging technology has assisted physicians in catching thyroid cancer at earlier stages, according to Jose C. Dutra, MD, an otolaryngologist on the medical staff at Northwestern Memorial, director of the Thyroid Surgical Clinic and assistant professor of Otolaryngology at the Feinberg School.

“We are much more likely to find thyroid cancer at an earlier stage than we were 15 or 20 years ago,” Dr. Dutra says. “This generally results in a better outcome and quality of life for the patient.”

Cord Sturgeon, MD, director of Endocrine Surgery at Northwestern Memorial and assistant professor of Surgery at the Feinberg School, says that thyroid cancer may be detected during a routine physical exam or through imaging such as CT, MRI or PET scans for unrelated conditions.

“If an abnormality is discovered, it usually leads to thyroid function studies and ultrasound-guided fine needle biopsy of suspicious thyroid nodules or lymph nodes,” Dr. Sturgeon says. “Recent studies have surprisingly shown that serum thyroid stimulating hormone (TSH) is an independent predictor of the presence of thyroid cancer and this will hopefully allow us to detect cancers at an earlier and more curable stage.”

Some patients with cancers smaller than 2 cm that have not spread are candidates for video-assisted thyroid surgery. “We make a very small incision, up to about 2.5 cm,” Dr. Dutra says. “Using special retractors and an endoscope, we perform a dissection of the thyroid gland. A nearby video screen displays a magnified view of the interior surgical field, which can provide additional help in our efforts to avoid injury to nerve tissue.”
Cancer Review Highlights – Fiscal Year 2008

- Northwestern Memorial significantly enhanced its cancer program facilities with the October 2007 opening of the new Prentice Women’s Hospital, with two floors dedicated to cancer care. Key program components that relocated to this state-of-the-art facility include 72 inpatient hematology/oncology beds with additional beds for gynecologic oncology patients on an adjacent floor; an expanded Lynn Sage Comprehensive Breast Center; and a satellite radiation oncology facility. In 2009, the Lurie Cancer Center will expand outpatient services in Prentice Women’s Hospital to include space for outpatient breast medical oncology and gynecologic oncology, allowing for a fully integrated Women’s Cancer Program.

- In 2008, Northwestern Memorial conducted regular multidisciplinary conferences that provided prospective treatment planning for patients needing care for all solid tumor types, hematologic malignancies, stem cell transplantation and palliative care.

- Through its affiliation with the Lurie Cancer Center, Northwestern Memorial offered a variety of education, support and outreach programs:
  - Professional education programs included the 10th annual Lynn Sage Breast Cancer Symposium; the 10th annual Oncology Nursing Conference; an American Society of Clinical Oncology Review; and annual programs in basic sciences and gastrointestinal oncology.
  - Patient education and support services included support groups, inpatient case management and an outpatient supportive oncology team providing social work, psychology, nutrition and symptom management services. This core team was supplemented by a full-time American Cancer Society Patient Navigator and a full-time health educator. A late-effects clinic offering specialty services to adult survivors of pediatric cancer also was provided, as was a program addressing the specialized needs of geriatric cancer patients.
  - Community education programs included the Lynn Sage Breast Cancer Town Hall, with nearly 400 in attendance, and cancer survivorship initiatives such as the 15th annual Cancer Survivors’ Celebration and Walk on the Chicago lakefront in June, with nearly 4,000 participants.
  - Northwestern Memorial, in conjunction with the Lurie Cancer Center, became a lead provider for the Illinois Breast and Cervical Cancer Program, an initiative of the Illinois Department of Public Health providing access to screening and care for uninsured and low-income women.
  - Faculty recruitments to multidisciplinary care and research teams in fiscal year 2008 included:
    - David M. Mahvi, MD, an internationally recognized leader in the field of gastrointestinal malignancies, was recruited from the University of Wisconsin to the leadership position of chief of Gastrointestinal and Oncologic Surgery at Northwestern Memorial. Dr. Mahvi also is a professor of Surgery at the Feinberg School.
    - Jessica K. Altman, MD, was recruited to the Hematology/Oncology division at Northwestern Memorial following completion of a fellowship at the hospital and holds clinical and research interests in the study and treatment of hematologic malignancies. Dr. Altman is an oncologist on the medical staff at Northwestern Memorial and assistant professor of Medicine at the Feinberg School.
    - Alex C. Minella, MD, was recruited from the Fred Hutchinson Cancer Research Center in Seattle, also to the Hematology/Oncology division, and is involved in research focusing on cell cycle regulation in healthy and cancerous cells, with a special emphasis on hematopoietic and breast cancers. Dr. Minella is an oncologist on the medical staff at Northwestern Memorial and assistant professor of Medicine at the Feinberg School.
    - Chonghui Cheng, MD, PhD, was recruited from Massachusetts Institute of Technology to the Hematology/Oncology division at Northwestern Memorial and conducts an active laboratory program in cancer signaling and tumorigenesis with a special emphasis on lung and breast cancers. Dr. Cheng is assistant professor of Medicine at the Feinberg School.
    - Sean Grimm, MD, a neuro-oncologist, was recruited from Memorial Sloan-Kettering Cancer Center to the Department of Neurology at Northwestern Memorial and has primary clinical research and care interests in the treatment of brain and spinal cord tumors as well as metastatic brain tumors from other systemic cancers. Dr. Grimm is a neurologist on the medical staff at Northwestern Memorial and assistant professor of Neurology at the Feinberg School.
    - Khashayarsha Khazaie, PhD, DSc, was recruited from Harvard University to the Gastroenterology division at Northwestern Memorial and conducts an active laboratory research program focused on tumor immunology.
    - Gail Gamble, MD, was recruited from Mayo Clinic to the Rehabilitation Institute of Chicago and will provide medical direction for a comprehensive cancer rehabilitation program for patients from both Northwestern Memorial and other healthcare providers.

Through the Clinical Research Office (CRO) of the Lurie Cancer Center, a total of 769 patients at Northwestern Memorial were enrolled in 229 interventional therapeutic and non-therapeutic clinical trials. Under the direction of Timothy Kuzel, MD, a hematologist/oncologist on the medical staff at Northwestern Memorial and professor of Medicine at the Feinberg School, the CRO conducts and coordinates Phase I through Phase III clinical trials. For a full list of interventional studies in cancer research, please visit www.cancer.northwestern.edu.
2007 Registry Report

Northwestern Memorial Hospital’s Tumor Registry is under the guidance of the Committee on Cancer. The registry collects and maintains comprehensive information for all reportable cancer cases and reportable-by-agreement cases diagnosed and/or treated at Northwestern Memorial. This information guides patient care by helping to determine the effectiveness of current therapeutic interventions and providing direction for future therapies.

Registry data is sent to the Illinois State Cancer Registry, the National Cancer Data Base and the American Cancer Society for reporting and survival statistics.

Northwestern Memorial’s Tumor Registry has been in existence since 1992 and is the largest registry in Illinois. The registry currently follows 41,913 patients yearly.

Top 10 Sites 2007

<table>
<thead>
<tr>
<th>PRIMARY SITE</th>
<th>NORTHWESTERN MEMORIAL HOSPITAL (N=2,785)</th>
<th>UNITED STATES* (N=1,085,820)</th>
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<tbody>
<tr>
<td>Breast</td>
<td>31%</td>
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<tr>
<td>Prostate</td>
<td>22%</td>
<td>20%</td>
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<tr>
<td>Colon/Rectum</td>
<td>10%</td>
<td>14%</td>
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<tr>
<td>Lung</td>
<td>8%</td>
<td>20%</td>
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<tr>
<td>Blood and Bone Marrow</td>
<td>6%</td>
<td>6%</td>
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<tr>
<td>Lymphoma</td>
<td>5%</td>
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<tr>
<td>Melanoma</td>
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<td>5%</td>
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<tr>
<td>Kidney</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Thyroid</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Corpus Uteri</td>
<td>4%</td>
<td>3%</td>
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</table>

* American Cancer Society Facts and Figures 2007

2007 Registry Activities and Accomplishments

- Added 3,610 new cases to the registry
- Achieved 92% follow-up for cases diagnosed within the past five years
- Completed 26 requests for data to monitor, improve and evaluate patient care and survival trends

Primary Site Tabulation For 2007

<table>
<thead>
<tr>
<th>PRIMARY SITE</th>
<th>TOTAL</th>
<th>CLASS A</th>
<th>N/A*</th>
<th>SEX</th>
<th>% of Cases</th>
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<tbody>
<tr>
<td>Oral Cavity</td>
<td>73</td>
<td>67</td>
<td>6</td>
<td>21</td>
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<td>Digestive System</td>
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<td>553</td>
<td>54</td>
<td>267</td>
<td>15</td>
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<td>Esophagus</td>
<td>35</td>
<td>32</td>
<td>3</td>
<td>29</td>
<td>6</td>
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<tr>
<td>Stomach</td>
<td>45</td>
<td>43</td>
<td>2</td>
<td>24</td>
<td>21</td>
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<tr>
<td>Colon</td>
<td>183</td>
<td>160</td>
<td>23</td>
<td>99</td>
<td>84</td>
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<tr>
<td>Rectum</td>
<td>108</td>
<td>102</td>
<td>6</td>
<td>56</td>
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<td>Anus/Anal Canal</td>
<td>22</td>
<td>22</td>
<td>0</td>
<td>6</td>
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<td>Liver</td>
<td>83</td>
<td>71</td>
<td>12</td>
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<td>Pancreas</td>
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<td>76</td>
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<tr>
<td>Other</td>
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<td>47</td>
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<td>26</td>
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<td>Respiratory System</td>
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<td>21</td>
<td>128</td>
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<td>Nasal/Sinus</td>
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<td>5</td>
<td>1</td>
<td>2</td>
<td>4</td>
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<td>24</td>
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<td>3</td>
<td>21</td>
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<tr>
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<td>107</td>
<td>17</td>
<td>101</td>
<td>123</td>
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<tr>
<td>Other</td>
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<td>4</td>
<td>0</td>
<td>4</td>
<td>0</td>
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<tr>
<td>Blood and Bone Marrow</td>
<td>244</td>
<td>169</td>
<td>75</td>
<td>137</td>
<td>6.1</td>
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<td>86</td>
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<td>18</td>
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<tr>
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<td>Breast</td>
<td>911</td>
<td>873</td>
<td>38</td>
<td>12</td>
<td>899</td>
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</tbody>
</table>

* Analytic (A) are newly diagnosed cases that have received part or all of first course of treatment at Northwestern Memorial.
** Non-analytic (N/A) are cases that received all first course of treatment elsewhere and came to Northwestern Memorial for subsequent treatment.

Total Analytic Cases 2003 to 2007

Since 2003, there has been a 24% increase in the number of analytic cases seen at Northwestern Memorial, from 2,912 cases in 2003 to 3,610 in 2007.
Committee on Cancer

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SUBMITTED BY
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UNDER THE MANAGEMENT OF
Michelle A. Janney, RN, PhD, NEA-BC
Senior Vice President and Chief Nurse Executive
Northwestern Memorial Hospital

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Division of Public Relations, Marketing and Physician Services
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