Chair’s Report

At the Rush University Cancer Center, we merge the concepts of individualism and teamwork to create a balanced and thoughtful approach to patient care. We know that when it comes to cancer care, one size does not fit all. That’s why when patients come to Rush, they can expect their care team to establish highly individualized care plans based on each person’s unique needs.

In addition to presenting our 2013 cancer registry numbers (see p. 23), this report also highlights the following:
- Rush’s commitment to protecting and maintaining patients’ quality of life
- Our expertise in treating complex and incurable cancers
- Our collaborative efforts to improve care for each patient we treat

Research and quality initiatives
At Rush, not only do we focus on providing the most advanced care to our patients, we also conduct research on that care and develop systems to improve care. Below are some examples of this commitment:

Decrease wait times for bone marrow biopsies at Rush: The bone marrow transplant team conducted a study to evaluate wait times for patients who need a biopsy to determine if they are able to receive a bone marrow transplant. After determining the wait times were not optimal, the team began taking steps to decrease wait times.

To do this, the team increased available time slots for biopsy appointments and implemented a new, four-step process that streamlines the evaluation and scheduling process. Through the new process, bone marrow transplant coordinators work closely with cancer center clinicians to determine ideal wait times for each patient (depending on each patient’s individual case) and schedule appointments accordingly.

By decreasing wait times, clinicians decrease the chances for breaks in patients’ continuity of care and extended chemotherapy regimens.

Ease the effects of radiation: To help ease the effects of radiation for head and neck cancer patients, clinicians at Rush have started using MuGard, a mucoadhesive oral wound rinse, as the standard of care for patients who are at risk of developing mucositis as a side effect of head and neck cancer therapy.

Clinicians have found that patients who use MuGard and are compliant with patient instructions had significant clinical benefits. These benefits include lower grades of oral mucositis, reduced pain and reduced analgesic use. Patients were also better able to stay nourished and maintain their weight.

Reduce side effects: In a study published in the Journal of Clinical Oncology, the Radiation Therapy Oncology Group Sarcoma Committee found that using preoperative image-guided radiotherapy to more precisely target radiation beams to treat soft tissue cancers in the extremities significantly reduces long-term side effects without affecting survival rates. The findings will likely establish a new standard of care for soft tissue sarcomas. Dian Wang, MD, a radiation oncologist at Rush, is the lead author of the paper.

Use of targeted treatments: Clinicians in the genetic testing for cancer programs at Rush have been heavily involved in researching poly ADP-ribose polymerase (PARP) inhibitors that provide targeted treatment for breast and ovarian cancers associated with certain genetic mutations. In December, the U.S. Food and Drug Administration approved the PARP inhibitor, olaparib, for women with advanced ovarian cancer associated with BRCA genetic mutations and who have had three lines of chemotherapy. Through Rush’s research with PARP inhibitors, medical oncologist Lydia Usha, MD, and her colleagues in cancer genetics have identified many patients at Rush who may now benefit from this drug. In clinical trials of olaparib, prolonged progression-free survival was seven to eight months longer for women who received the drug compared to those who did not. Usha is also the principal investigator of another clinical trial (which is now open at Rush) with olaparib for women with advanced breast cancer and BRCA mutations.
Spearhead collaborative studies: Chief of colon and rectal surgery Bruce Orkin, MD, has developed a national registry for rectal cancer patients treated with transanal approaches, including transanal excision, transanal endoscopic microscopy (TEM) and transanal minimally invasive surgery (TAMIS). About 15 institutions across the country have submitted more than 4,000 patients who underwent these procedures — and the number of participating institutions continues to rise.

TEM and TAMIS procedures are performed by only a limited cadre of experienced surgeons in the U.S. (including Orkin). Each surgeon has performed up to several hundred cases with carefully selected patients. Studies of the data from this registry will answer questions that cannot be answered without a much larger number of patients than any one medical center can provide.

A team effort

I would like to take this opportunity to thank the many organizations that Rush collaborates with to provide high-quality patient care, including the Commission on Cancer of the American College of Surgeons.

I would also like to extend my gratitude to everyone involved in the cancer program for their dedication and commitment to our patients. At each and every level at Rush, staff make unique contributions that raise our standards of care.

Cancer Committee Chair Aidnag Diaz, MD, MPH

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Rush University Cancer Center at a Glance

The Rush University Cancer Center comprises all cancer-related clinical, research and educational efforts at Rush, crossing 20 departments, divisions and sections; inpatient and outpatient areas; professional clinical activities; and the colleges of Rush University.

Support Services
The Rush University Cancer Center is committed to helping patients and their families cope with potential psychological, emotional and spiritual challenges often associated with a cancer diagnosis. Available support services at Rush include the following:

- **Social work services** include a licensed clinical social worker dedicated to cancer patients at Rush, as well as a social worker from the American Cancer Society. They both meet with patients and family members to determine patients’ and families’ needs and provide the necessary support.

- **Psychotherapy and other psychosocial oncology services** help patients, caregivers and families manage stress and physical symptoms.

- **Nutrition counseling** can help patients improve their health through diet. A registered dietitian provides individualized recommendations to meet health goals, such as increasing energy or managing treatment side effects.

- **Palliative care services** aim to improve the quality of life for patients and their families. These recently expanded services focus on reducing pain, stress and other symptoms.

- **Pastoral services** are available from chaplains at Rush to support the spiritual and emotional health of patients and families.

- **Support groups and activities**, many on the Rush campus, offer opportunities for patients and families to share their feelings and experiences with others who are living with cancer.

- **Survivorship care planning** includes comprehensive plans for patients and their primary care physicians regarding the care received and follow-up recommendations.

- **Integrative therapies** — such as acupuncture and massage therapy — are available through the Cancer Integrative Medicine Program to reduce the mental and physical stresses that often accompany traditional cancer treatment.

- **A Susan G. Komen patient navigator** helps remove barriers that prevent women from getting regular screening mammograms.

- **A genetic counselor** dedicated to the cancer center sees patients with suspected predispositions to breast, gynecologic and gastrointestinal cancers, along with rare endocrine tumors and sarcomas.

Residency and Fellowship Programs

- Residency in radiation oncology
- Residency in nuclear medicine
- Fellowship in hematology/medical oncology
- Fellowship in orthopedic oncology
- Fellowship in hospice and palliative medicine

Advancing Medicine Through Research
The Rush University Cancer Center fosters research across four broad programs that aim to deepen our understanding of cancer to better prevent, detect and treat it:

- Cancer biology
- Clinical, behavioral and translational research
- Molecular signatures and cancer outcomes
- Tumor immunology
Comprehensive Clinics

Rush, which serves both adults and children with cancer, is home to The Coleman Foundation comprehensive clinics. These multidisciplinary clinics apply a team approach to patient care. The clinical team gathers to discuss the patient’s condition, review diagnostic tests and develop a treatment plan, in collaboration with the patient’s diagnosing physician whenever possible.

The comprehensive clinics are dedicated to the following:

- Blood and bone marrow transplants
- Brain cancer
- Breast cancer
- Chest and lung tumors
- Gastrointestinal cancers
- Gynecologic cancers
- Head and neck cancers
- Inherited susceptibility to cancer
- Leukemias
- Lymphomas
- Melanoma and soft tissue tumors
- Multiple myeloma
- Myelodysplastic/myeloproliferative neoplasms
- Prostate cancer
- Sarcomas
- Spine tumors

Recognition and Accreditations

- Rush has received four consecutive outstanding achievement awards from the Commission on Cancer of the American College of Surgeons.
- The Coleman Foundation Blood and Bone Marrow Transplantation Clinic is accredited by the Foundation for the Accreditation of Cellular Therapy.
- Rush’s pathology and clinical laboratories are accredited by the Joint Commission.
- Three times in a row, Rush has received Magnet status — the highest recognition for nursing excellence — from the American Nurses Credentialing Center.
- The Regenstein Breast Imaging Center at Rush is an American College of Radiology-Accredited Center of Excellence. This designation is awarded to centers that have received full accreditation in mammography, breast ultrasound, and stereotactic and ultrasound-guided needle biopsies.
- The Association for the Accreditation of Human Research Protection Programs has awarded Rush full accreditation with distinction in Community Programs, giving special recognition to Rush’s community-based participatory research.
- In 2014, Rush received the University HealthSystem Consortium’s (UHC) Quality Leadership Award, ranking fifth among 104 academic medical centers in UHC’s annual Quality and Accountability Study. Rush is the only medical center in Illinois to be listed among the top 10 in 2014.
- The Rush Radiosurgery program is one of the few Novalis-Certified radiosurgery centers in the country.

For more information about cancer programs at Rush or to refer a patient for an initial visit or a second opinion, please call (312) CANCER-1 (226-2371).
RUSH CANCER NETWORK*

* Sites affiliated with Rush's cancer program that remain separate and independent with respect to professional judgment and liability.
Curative therapies don’t always translate into good quality of life. We believe it’s not just about curing, it’s also about making sure patients have a life to look forward to.”

— Hematologist/oncologist Melissa Larson, MD
Single-Dose Treatment for Breast Cancer

Since the late 1990s, clinicians in Europe have used intraoperative radiation therapy (IORT) — a one-dose radiation treatment — during a lumpectomy to lower the risk of recurrence in women with early-stage breast cancer. After the Food and Drug Administration approved IORT in the U.S., select medical centers, including Rush, began offering this innovative treatment to patients. Currently, Rush is one of the few medical centers in the Midwest to provide IORT.

How it works
Breast surgeons and radiation oncologists work together in the operating room to administer one precise, concentrated dose of radiation to the tumor site immediately following the surgical removal of the cancer. After the surgeon removes the tumor, the radiation oncologist inserts electronic brachytherapy to the lumpectomy cavity to deliver low-energy radiation at a high-dose rate to the breast tissue, while avoiding radiation to nearby organs.

IORT offers comparable outcomes to treating the whole breast externally with standard radiation, but with fewer side effects and shorter treatment time. Treatment time depends on the size of the lumpectomy cavity but usually lasts approximately 15 minutes, and patients receive just a single dose. Comparatively, patients who receive standard external beam radiation after breast cancer surgery go to the hospital for treatment five days a week, for three to six weeks.

“About 80 percent of breast cancer recurrences are in the same quadrant of the breast where the patient’s initial breast cancer was,” says breast surgeon Katherine Kopkash, MD. “We may be overtreating some patients by delivering radiation to the entire breast.”

IORT at Rush
Kopkash helped develop the IORT program at Rush when she arrived in 2013. She and her breast surgeon colleagues, Andrea Madrigrano, MD, and Darius S. Francescatti, MD, began treating patients with IORT in January 2014.

They have since treated 26 patients: 25 with breast cancer and one with gynecologic cancer. None of the 26 patients required further radiation.

26
Number of patients treated for cancer with IORT since 2014. None have required further radiation.

Radiation oncologist Katherine Griem, MD, and breast surgeon Katherine Kopkash, MD, work closely to determine the right placement for the IORT during lumpectomy surgery.
In October 2014, Rush began enrolling patients in the national phase II clinical trial, “A Safety and Efficacy Study of Intra-Operative Radiation Therapy (IORT) Using the Xoft Axxent eBx System at the Time of Breast Conservation Surgery for Early-Stage Breast Cancer.” This study will follow patients for 10 years and examine recurrence risk and quality of life.

Survivor mode
Surgical recovery time after lumpectomy with IORT is the same length as lumpectomy without IORT. However, IORT drastically decreases patients’ overall time spent in the hospital for breast cancer treatment. This is particularly important for women who live in rural areas and must travel for treatment.

“Traveling to the hospital for radiation is a challenge for many women, and these women often choose to have a mastectomy rather than going for radiation,” says radiation oncologist Katherine Griem, MD. “IORT allows more women the option of receiving breast-conserving treatment.”

There is also a psychological benefit to having surgery and treatment completed simultaneously. “It helps take breast cancer out of patients’ daily lives,” says Kopkash. “It’s often the radiation — spending hours a day, many days a week for up to six weeks at the hospital — that makes women feel like ‘cancer patients.’ Having IORT helps patients transition into survivor mode more quickly.”

Rush offers the following advanced surgical options and implant technologies for women with breast cancer:

- Regenerative human acellular tissue implants
- Direct-to-implant single-stage immediate breast reconstruction
- Delayed/staged reconstruction
- Combined tissue expander and implant reconstruction with latissimus flap
- Microvascular tissue flap procedures, including TRAM flap and DIEP flap
- Nipple-sparing procedures
- Oncoplastic breast reduction (lumpectomy combined with breast reduction)

RESTORING BREAST CANCER PATIENTS’ SENSE OF SELF

Breast reconstruction helps many breast cancer patients cope with the sense of powerlessness they often feel when they lose a breast. “Reconstruction is not simply a cosmetic procedure; it is incredibly important from a psychological and functional standpoint,” says plastic and reconstructive surgeon Anuja Antony, MD, MPH. “It helps restore a woman’s sense of self.”

Plastic surgeons and breast surgeons at Rush partner to plan the details of the surgeries as a team, detailing the incisions, techniques and other modalities for each patient.

“Breast reconstruction helps women feel like breast cancer survivors rather than breast cancer victims.”

— Plastic and reconstructive surgeon Anuja Antony, MD, MPH

“... This option allows patients to return to their lives faster by potentially reducing the need for further therapies.”

— Breast surgeon Katherine Kopkash, MD
Minimizing Lung Cancer Side Effects

A lung cancer diagnosis can turn a person’s life upside down. This is especially true for late-stage metastatic disease, when the five-year survival rate is just 4 percent. Even when it’s caught early, the physical and emotional impact of lung cancer can still take its toll. That’s why lung cancer care at Rush focuses as much on ensuring quality of life as it does on extending life.

Putting people first
The multidisciplinary team at The Coleman Foundation Comprehensive Lung Cancer Clinic meets weekly to review cases.

But the team doesn’t just discuss which treatment will yield the best clinical outcomes. They talk about how to help one patient remain ambulatory so he can visit his first grandchild. And how to relieve another patient’s neuropathy so she can keep working and supporting her family.

“We never forget that we’re treating a person, not just a tumor,” says Michael Liptay, MD, chairperson of cardiovascular-thoracic surgery.

The clinic comprises thoracic surgeons, medical and radiation oncologists and pulmonologists. But it also includes a palliative care physician, Elaine Chen, MD, who helps manage patients’ symptoms and provides psychosocial support — in partnership with the clinic’s psychosocial oncologist — for patients and their families.

“Having all these experts working together, talking to each other in real time, enables us to coordinate every aspect of care,” says thoracic surgeon Christopher Seder, MD. “We can make sure all of our patients’ needs are met.”
Less radiation exposure

Many lung cancer treatments at Rush are designed with quality of life in mind.

For instance, in recent years conventional external beam radiation therapy — an option for small, localized lung tumors — has given way to techniques that offer accuracy in less time and with less discomfort.

Stereotactic radiosurgery, for example, produces beams of radiation sculpted to match the three-dimensional shape of the tumor so less surrounding tissue is exposed. The system also detects and corrects for even minuscule movements, ensuring pinpoint precision if the patient isn’t completely still. Each session takes only five to 15 minutes, and patients are able to return to normal activities immediately afterward.

In many cases, stereotactic radiosurgery can eradicate small tumors with very little toxicity to healthy lung tissue. This therapy gives hope to patients who are not good candidates for even minimally invasive surgery because they have too many comorbidities.

A shift in surgery

Lung cancer surgery, too, is trending toward a “less is more” approach. At Rush, thoracic surgeons are leaders in video-assisted thoracoscopic surgery (VATS), a minimally invasive technique, for lobectomy. Lobectomy is the most effective operation for removing localized lung tumors. But it is a big procedure with a long, often painful recovery.

Because of their expertise, thoracic surgeons at Rush use VATS for 74 percent of the lobectomies they perform for stage I tumors. As a result, the average length of stay after lobectomy for lung cancer at Rush is 4.2 days (the national average is 7.3), and the 30-day mortality rate is just 0.3 percent. Other benefits to VATS: less pain and a quicker return to activities of daily living.

“We’re seeing patients now who had VATS lobectomies five, six years ago,” says Liptay. “Not only are they cancer-free, but they have a great quality of life. That’s just as important — to them and to us. Our patients aren’t just alive, they are living.”

Making every day count

Unfortunately, the prognosis is not as promising for people with late-stage lung cancer. That’s why, for people diagnosed with late-stage disease, early palliative care is now indicated to help guide end-of-life decisions and care.

In addition to addressing pain and other symptoms, as she also does for patients in the earlier stages, Chen helps late-stage patients set and work toward meaningful but realistic goals.

“They may not survive their cancer, but I’ll do my best to get them to their child’s high school graduation or enable them to take their dream vacation,” she says. “I want them to live the rest of their lives as fully as possible — whatever that means for them.”

The Society of Thoracic Surgeons designated the Rush Department of Cardiovascular and Thoracic Surgery as a three-star program for lobectomy. It’s the society’s highest rating, bestowed on only the top 5 percent of thoracic surgery programs in the U.S.
Assessing Patients’ Distress

Receiving a cancer diagnosis is an emotional blow that can leave patients reeling and struggling to cope. In fact, about 25 to 33 percent of cancer patients develop clinical depression or an anxiety disorder after diagnosis, according to a study in the *Lancet Oncology*.

In 2014, Rush implemented two distress screening tools for patients diagnosed with cancer to address their psychosocial needs. These tools help clinicians determine the severity of patients’ psychological, social, financial and behavioral hardships. Clinicians can then refer patients to the appropriate psychosocial services through the cancer center.

“We are looking at distress as a vital sign; something as important as your blood pressure or heart rate,” says psychologist James Gerhart, PhD, the clinical lead for cancer distress screening at Rush. “The stress response to a cancer diagnosis causes a lot of wear and tear on the body. It takes energy to have a stress reaction, to panic or to become angry. Those are resources in patients’ bodies that are being diverted away from healing.”

Choosing the best tools

To screen patients in the most effective and efficient manner, Rush uses the following evidenced-based tools:

- **Patient Health Questionnaire 9**: As one of the most widely used measures nationwide for distress screening, the questionnaire addresses the nine core symptoms of depression by asking patients questions related to their mood, sleep, appetite and emotional state.

- **National Comprehensive Cancer Network distress thermometer**: This questionnaire asks patients to rate their stress levels on a 10-point scale, along with yes or no questions about relevant issues, such as family concerns, physical symptoms and spiritual struggles.

“While the questionnaires themselves only take about five to 10 minutes to complete, they give us an idea of where to start the conversations and how to help our patients,” says Gerhart. “The good news is that we have very effective approaches to manage stress once it’s identified.”

A pilot study at Rush that assessed the screening tools on patients with lung and gastrointestinal cancers found a great need for screening, with 20 to 30 percent of the patients showing a need for psychosocial oncology and supportive care.

After this pilot program, Rush implemented the distress screening protocols throughout all of the disease sites treated in the cancer center.
“The amazing thing about Rush is that we are committed to safety and excellence in clinical care, while, at the same time, offering our patients cutting-edge treatments.”

— Neuro-oncologist Nina Paleologos, MD
For radiation oncologist Aidnag Diaz, MD, MPH, conforming radiation fields to spare the hippocampus is standard for every brain tumor patient he treats at Rush, whenever clinically possible.

Evidence-based protocols
Hippocampal sparing is standard protocol at Rush thanks to seminal research by a team of radiation oncologists from Rush who investigated its feasibility during whole brain radiotherapy.

In a 2010 published review of 107 cases and 700 lesions, the team found that metastases occurred in the hippocampus in only 0.8 percent of the cases, and in the limbic circuit in fewer than 3 percent of cases. This finding led the researchers to the conclusion that it was possible in most cases to eliminate metastases with radiation while sparing the hippocampus and the limbic areas, where metastases were unlikely to occur.

Aggressive and focused
This philosophy of focused treatment to enhance a patient’s quality of life is part of the aggressive, yet targeted treatment Diaz and his colleagues bring to all primary brain tumor and cerebral metastases patients at Rush.

For radiation therapy, Rush’s advanced technologies, including stereotactic radiosurgery, allow for extremely precise radiation fields. This precision enables high doses to the tumor, while minimizing the damaging side effects of whole brain radiation.

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Validating clinical significance
“The high volume of brain tumor patients we see at Rush gives us not only greater experience treating these tumors; it gives us the number of patients needed to determine clinical significance through studies — which in turn helps us learn even more about treating these tumors with less toxicity and greater effectiveness,” says Diaz.

In a 2014 study published in Surgical Neurology International, Diaz and neurosurgeon Lorenzo Muñoz, MD, found that resection plus stereotactic radiosurgery to the cavity resulted in comparable survival rates for cerebral metastases versus whole brain irradiation, the current standard.

Additionally, stereotactic radiosurgery using the TrueBeam STx radiosurgical tool significantly reduces treatment times (up to one third less than other radiosurgical tools). This means the patients are less likely to move during treatment, adding to the precision of the treatment by keeping the radiation inside the tumor field.

And, to minimize exposure to steroids and decrease their potential side effects, the multidisciplinary team employs a rapidly tapered corticosteroid protocol.

Nearly 70,000 new cases of primary brain tumors will be diagnosed this year.
(Source: American Brain Tumor Association)
Improved Options for Head and Neck Cancers

In 2014, the head and neck program at Rush added two nationally renowned head and neck surgeons, Pete Batra, MD, chairperson of the Department of Otorhinolaryngology – Head and Neck Surgery, and Kerstin Stenson, MD, director of the Rush Head and Neck Cancer Program.

Batra, Stenson and the other leading head and neck cancer specialists at Rush utilize the most advanced treatments, including image-guided surgery and minimally invasive endoscopic surgery, that focus on both curing the cancer and maintaining patients’ quality of life.

Many head and neck cancer patients receive care through The Coleman Foundation Comprehensive Head and Neck Cancer Clinic.

Endoscopic resection for skull base tumors
In 2014, Rush began offering minimally invasive endoscopic resection of skull base tumors. During the procedure, the surgeon uses small endoscopes to remove tumors deep inside the nose and sinuses. With comparable outcomes to open surgery, minimally invasive surgery decreases the risk of complications with vision, swallowing, taste and speech, while also maintaining the patient’s appearance.

“With open surgery, patients often don’t look or feel the same ever again — and that is very important to consider in terms of quality of life,” says Batra. “Minimally invasive surgery allows us to preserve the function so patients can look and feel like themselves.”

Less toxic treatments
To treat head and neck cancers, clinicians can now pinpoint targeted areas and treat these areas with less radiation after surgery. “While we are still quite aggressive with treatment, patients receive less radiation after surgery than they have in the past,” says Stenson.

Patients who can typically receive less postoperative radiation or upfront chemoradiation are those who have HPV-related oropharyngeal cancer. “We have discovered that patients with HPV-related cancers have tumors that are much easier to cure than non-HPV related tumors,” says Stenson.

“And we are making great strides in decreasing long-term effects of treatments and morbidity.”

According to recent studies
72% of oropharyngeal cancers are caused by HPV.

Advanced Treatments

Patients at Rush have access to the following advanced treatments for head and neck cancers:

- Microvascular reconstruction, including techniques for patients with complicated resections/wounds
- Facial nerve repair and facial paralysis reconstruction/treatment
- Endoscopic minimally invasive resection of sinus and skull base tumors
- Transoral robotic surgery
- Transoral laser microsurgery
- Transnasal fiberoptic video laryngoscopy and esophagoscopy
- Transoral surgery for tumors of the larynx, tongue and throat (outpatient)
- Intraoperative 3D modeling for jaw reconstruction
- Intensity-modulated radiation therapy
- Stereotactic radiosurgery
- Treatment for patients with complications of chemoradiation (e.g., osteoradionecrosis, swallowing problems)
New Treatments for Hematologic Cancers

Developing new drugs to fight complex cancers can be a long, expensive journey with certain pitfalls. To combat this challenge, hematologist/oncologist Reem Karmali, MD, is exploring how to use existing medications in different ways to develop novel treatments for hematologic malignancies.

Specifically, Karmali’s research focuses on using a common diabetes medication (Metformin) as an adjunct to standard chemotherapy for patients with aggressive lymphomas and leukemias. “Observational data shows that lymphoma patients who received chemotherapy but also happened to be on Metformin have improved outcomes and survival,” says Karmali.

Q: What is the relationship between diabetes medications and treatment for hematologic malignancies?
A: The insulin-like growth factor-1 pathway (a pathway involved in insulin signaling) is very relevant to tumor proliferation and survival. Research suggests that people who have higher insulin levels or insulin resistance tend to be more prone to cancers, including hematologic cancers. Knowing that insulin may have a role in proliferation, we thought we could counter the effects of insulin signaling with anti-diabetic medication to see if that affects the response of a patient’s cancer to standard chemotherapy.

Q: What are you looking for in your research?
A: We have looked at protein components of this pathway that could have bearing on the aggressive nature of hematologic malignancies. From there, we identified specific proteins within the pathway to give us a sense of how an individual’s cancer is going to behave.

We are now looking at how Metformin affects cancer cell growth, proliferation and protein markers involved in the insulin-like growth factor-1 pathway. These changes will be associated with the survival of a patient to determine how it all comes together.

Q: What is the benefit of using an existing drug like Metformin?
A: We have been using Metformin to treat diabetes for years, so we have a good understanding of its safety profile, and it is not terribly toxic. Also, if it circumvents relapse, we would not have to use more toxic second lines of therapy.

Additionally, many of the newer drugs are very expensive. Metformin is inexpensive, so there are obvious economic implications, as well.

Q: Why is this type of research so important to hematologic cancers?
A: Research often drives treatment plans and prognosis for these types of cancers. This research could help improve upon how a patient responds to chemotherapy and the length of time that a response is maintained. Ultimately, it could help improve the survival rates for lymphomas and leukemias.
We are starting to really understand the biology of these cancers, which allows us to tailor therapy to each patient’s individual cancer.

— Hematologist/oncologist Reem Karmali, MD

Using Molecular Markers to Improve Treatment

Hematologists/oncologists are increasingly looking at patients’ genetic profiles to determine the most effective treatments. At Rush, most hematologic cancer patients undergo testing that evaluates specific molecular markers of their cancer cells. These markers help clinicians understand the unique pathways for therapies to reach the cancer cells, and the specific characteristics and behavior of each individual’s cancer.

In turn, researchers have developed novel agents such as ibrutinib and idelalisib that target specific pathways and molecular markers in cancer cells, thereby cutting off the growth of these cells.

“Unlike treatments available in the past, the newer agents are tailored to patients’ molecular characteristics,” says hematologist/oncologist Parameswaran Venugopal, MD. “We are now not only able to kill cancer cells with chemotherapy, but also cut off the pathways that lead to cancer development and recurrence without affecting the function of normal cells.”

COLLABORATIVE MEDICINE: PUTTING PATIENTS FIRST

Sometimes Rush’s team approach to treating hematologic cancers stretches beyond the Medical Center. Clinicians at Rush participate in consortia of five academic medical centers in the Chicago area that meet to discuss their most complex patients with lymphoma, myelodysplastic/myeloproliferative neoplasms (MDS/MPN) and myeloma. Several times a year, leading physicians in these three separate consortia gather at each of the respective medical centers to review cases and discuss treatment strategies.

“These partnerships have helped us improve care for our patients by bringing together specialists with a wide range of expertise,” says hematologist/oncologist Parameswaran Venugopal, MD. “Every member of these consortia is committed to doing what is best for all patients, regardless of which medical center and physician is treating them.”

By joining forces, Rush and the participating institutions are able to enroll more patients in clinical trials than they could on their own. These trials offer patients an opportunity to receive advanced treatments and therapies not readily available in community hospitals.

“The best part about these partnerships is exchanging ideas and information about clinical trials available at each institution and referring patients to the most promising and appropriate trials for which they are eligible,” says hematologist Jamile Shammo, MD, who helped found the MDS/MPN Chicago consortium and is a member of the international myeloproliferative neoplasms research consortium.

“As the director of the MDS/MPN program at Rush, I have participated in clinical trials that led to the approval of several new drugs for treating these disorders. We continue to participate in trials, offering alternative and novel options for patients who have failed standard of care approaches.”

“The best part about these partnerships is exchanging ideas and information about clinical trials available at each institution and referring patients to the most promising and appropriate trials for which they are eligible.”

— Hematologist Jamile Shammo, MD
Disease Site Programs

BONE AND SOFT TISSUE SARCOMAS

Clinical Specialists
Diagnostic radiologists:
John Meyer, DO; Anthony Zelazny, MD
Medical oncologist:
Marta Batus, MD
Orthopedic surgeons:
Matthew Colman, MD; Steven Gitelis, MD
Pathologists:
Leonidas Arvanitis, MD; Jerome Loew, MD; Brett Mahon, MD; Ira Miller, MD; Vijaya Reddy, MD
Pediatric hematologist/oncologists:
Pete Batra, MD; Richard Byrne, MD; Lorenzo Munoz, MD
Neurosurgeons:
Pete Batra, MD; Richard Byrne, MD; Lorenzo Munoz, MD
Neurologist:
R. Mark Wiet, MD
Ophthalmologists:
Adam Cohen, MD; Thomas Mizen, MD; Tamara Fountain, MD
Pediatric hematologist/oncologist:
Paul Kent, MD
Radiation oncologist:
Aidnag Diaz, MD, MPH
Speech pathologists:
Mike Hefferly, PhD; Michele Simer, MS
Brain Tumor Conference
Tuesdays, 11:30 a.m. to 12:30 p.m.
Janet Wolter, MD, Clinical and Educational Conference Room, 1010 Professional Building

BRAIN AND SKULL BASE TUMORS

Clinical Specialists
Medical oncologists
Mary Jo Fidler, MD; John Showel, MD
Neuro-oncologists:
Robert Aiken, MD; Nina Paleologos, MD
Neuropathologists:
Leonidas Arvanitis, MD; Paolo Gattuso, MD; Ritu Ghai, MD; Sukriti Nag, MD
Neuroradiologists:
Sharon Byrd, MD; Miral Jhaveri, MD; Mehmet Kocak, MD
Neurosurges:
Pete Batra, MD; Richard Byrne, MD; Lorenzo Munoz, MD
Neurologist:
R. Mark Wiet, MD
Ophthalmologists:
Adam Cohen, MD; Thomas Mizen, MD; Tamara Fountain, MD
Pediatric hematologist/oncologist:
Paul Kent, MD
Radiation oncologist:
Aidnag Diaz, MD, MPH
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BREAST CANCER

Clinical Specialists
Diagnostic radiologists:
Anne Cardwell, MD; Carol Corbridge, MD; Janice Dieschbourg, MD; Mireya Dondalski, MD; Peter Jokich, MD; Gene Solmos, MD; Lisa Stempel, MD
Medical oncologists:
Melody Cobleigh, MD; Katherine Kabaker, MD; Ruta Rao, MD; Lydia Usha, MD
Pathologists:
Melody Cobleigh, MD; Katherine Kabaker, MD; Ruta Rao, MD; Lydia Usha, MD
Medical oncologists:
Paolo Gattuso, MD; Ritu Ghai, MD
Plastic and reconstructive specialists:
Anuja Antony, MD, MPH; John Cook, MD; Gordon Derman, MD; George Kouris, MD
Radiation oncologist:
Katherine Griem, MD; Jessica Zhou, MD
Surgical oncologists:
Steven Bines, MD; Darius Francescatti, MD; Katherine Kopkash, MD; Andrea Madrigano, MD; Thomas Witt, MD; Norman Wool, MD
Breast Tumor Conference
Mondays, 4 to 5 p.m.
Janet Wolter, MD, Clinical and Educational Conference Room, 1010 Professional Building

ENDOCRINE AND THYROID CANCERS

Clinical Specialists
Diagnostic radiologist:
Amjad Ali, MD
Endocrine surgeon:
Kate Heiden, MD
Endocrinologists:
David Baldwin, MD; Antonio Bianco, MD; Raquel Carneiro, MD; Leon Fogelfeld, MD; Tiffany Hor, MD; Brian Kim, MD; Elizabeth McNinch, MD; Mahtab Sohrevardi, MD; Kristina Todorova-Koteva, MD
Medical oncologists:
Mary Jo Fidler, MD; Lauren Wiebe, MD
Otolaryngologists/head and neck surgeons:
Samer Al-Khudari, MD; Joseph Allegretti, MD; Phillip LoSavio, MD; Thomas Nielsen, MD; Kerstin Stenson, MD
Pathologists:
Paolo Gattuso, MD; Ritu Ghai, MD
Radiation oncologist:
Ross Abrams, MD
Endocrine Tumor Conference
Every other Tuesday, 8 to 9 a.m.
Location varies
Thyroid Cancer Tumor Conference
Every fourth Wednesday, 8 to 9 a.m.
Janet Wolter, MD, Clinical and Educational Conference Room, 1010 Professional Building

GASTROINTESTINAL CANCERS

Clinical Specialists
Colorectal surgeons:
Marc Brand, MD; Joanne Favuzza, DO; Bruce Orkin, MD; Marc Singer, MD
Gastroenterologists:  
A. Aziz Aadam, MD; Faraz Bishehsari, MD; Salina Lee, MD; John Losurdo, MD; Joshua Melson, MD, MPH; Sohrab Mobarhan, MD; Peter Sargon, MD

General surgeons:  
Daniel Deziel, MD; Minh Luu, MD; Keith Millikan, MD; Jonathan Myers, MD

Interventional radiologists:  
Bulent Arslan, MD; Allen Chen, MD; Jayesh Soni, MD; Ulku Cenk Turba, MD

Medical oncologists:  
Marisa Hill, MD; William Leslie, MD; Lydia Usha, MD; Lauren Wiebe, MD

Pathologist:  
Shriram Jakate, MD

Radiation oncologists:  
Ross Abrams, MD; Dian Wang, MD

Radiologists:  
John Hibbeln, MD

Thoracic surgeons:  
Gary Chmielewski, MD; Michael Liptay, MD; Christopher Seder, MD; William Warren, MD

Transplant hepatologists:  
Sheila Eswaran, MD; Nikunj Shah, MD

Transplant surgeons  
Edie Chan, MD; Sameh Fayek, MD; Martin Hertl, MD

Gastrointestinal Tumor Conference  
Tuesdays, 12:30 to 1:30 p.m.  
Janet Wolter, MD, Clinical and Educational Conference Room, 1010 Professional Building

Genitourinary Tumor Conference  
Last Tuesday of the month, 7 to 8 a.m.  
Janet Wolter, MD, Clinical and Educational Conference Room, 1010 Professional Building

Gynecologic Tumor Conference  
Fridays, 7 to 8 a.m.  
Pathology Conference Room, 562 Jelke Building

Head and Neck Tumor Conference  
Wednesdays, 7 to 8 a.m.  
Janet Wolter, MD, Clinical and Educational Conference Room, 1010 Professional Building

Hematologic Cancer Conference  
Leukemia: Mondays, 1 to 2 p.m.  
Lymphoma: Thursdays, 8 to 9 a.m.  
Multiple myeloma: every other Friday, 8 to 9 a.m.

Myelodysplasia/myeloproliferative disorders: every other Friday, 9 to 10 a.m.  
Janet Wolter, MD, Clinical and Educational Conference Room, 1010 Professional Building
**LIVER CANCER**

**Clinical Specialists**
- Diagnostic radiologist: Ryan Braun, MD
- Hepatologists: Sheila Eswaran, MD; Nikunj Shah, MD
- Interventional radiologists: Bulent Arslan, MD; Allen Chen, MD; Jayesh Soni, MD; Jordan Tasse, MD; Ulku Cenk Turba, MD
- Medical oncologist: Marisa Hill, MD
- Transplant surgeons: Edie Chan, MD; Sameh Fayek, MD; Martin Hertl, MD

**Liver Cancer Conference**
First and third Friday of the month, 7 to 8 a.m.
4th Floor, Tower, Suite 04413

**LUNG AND THORACIC CANCERS**

**Clinical Specialists**
- Medical oncologists: Marta Batus, MD; Philip Bonomi, MD; Mary Jo Fidler, MD
- Palliative medicine specialist: Elaine Chen, MD
- Pathologists: Paolo Gattuso, MD; Ritu Ghai, MD; Mark Pool, MD
- Pulmonary medicine specialists: Robert Balk, MD; Elaine Chen, MD; Michael Silver, MD; Betty Tran, MD, MS; Mark Yoder, MD
- Thoracic radiologist: Palmi Shah, MD

**Thoracic surgeons:**
Gary Chmielewski, MD; Michael Liptay, MD; Christopher Seder, MD; William Warren, MD

**Lung and Thoracic Tumor Conference**
Thursdays, 10 to 11 a.m.
Janet Wolter, MD, Clinical and Educational Conference Room, 1010 Professional Building

**MELANOMA AND CUTANEOUS CANCERS**

**Clinical Specialists**
- Dermatologists: Jeffrey Altman, MD; Lady Dy, MD; James Ertle, MD; Sheetal Mehta, MD; Warren Piette, MD; Arthur Rhodes, MD, MPH; Michael Tharp, MD
- Dermatopathologist: Vijaya Reddy, MD
- Diagnostic radiologist: Joy Sclamberg, MD
- Immunologists: Amanda Marzo, PhD; Carl Ruby, PhD; Andrew Zloza, MD, PhD
- Medical oncologist: Nicklas Pfanzelter, MD
- Neurosurgeon: Lorenzo Muñoz, MD
- Ophthalmologists: Adam Cohen, MD; Tamara Fountain, MD
- Plastic and reconstructive specialists: Gordon Derman, MD; Peter Revenaugh, MD
- Radiation oncologist: Ross Abrams, MD
- Stem cell transplantation specialists: Antonio Jimenez, MD; John Maciejewski, MD, PhD; Sunita Nathan, MD
- Surgical oncologists: Steven Bines, MD; Keith Monson, MD

**Melanoma and Soft Tissue Tumor Conference**
Wednesdays, 11 a.m. to noon
Janet Wolter, MD, Clinical and Educational Conference Room, 1010 Professional Building

**SPINE TUMORS**

**Clinical Specialists**
- Neuro-oncologists: Robert Aiken, MD; Nina Paleologos, MD
- Neurosurgeons: Ricardo Fontes, MD, PhD; John O’Toole, MD, MS
- Orthopedic surgeons: Matthew Colman, MD; Kern Singh, MD
- Radiation oncologist: Aidnag Diaz, MD, MPH

**Spine Tumor Conference**
Thursdays, 9 a.m. to noon
Woman’s Board Cancer Treatment Center, 500 S. Paulina St.

**PEDIATRIC CANCERS**

**Clinical Specialists**
- Orthopedic oncologist: Steven Gitelis, MD
- Pediatric hematologist/oncologists: Lisa Boggio, MD; Nisha Kakodkar, MD; Paul Kent, MD; Allen Korenblit, MD; Mindy Simpson, MD
- Pediatric neuroradiologist: Sharon Byrd, MD; Mehmet Kocak, MD
- Pediatric neurosurgeon: Lorenzo Muñoz, MD
- Plastic and reconstructive specialist: Gordon Derman, MD
- Radiation oncologists: Ross Abrams, MD; Aidnag Diaz, MD, MPH

**Pediatric Oncologists**
- Orthopedic oncologist: Steven Gitelis, MD
- Pediatric hematologist/oncologists: Lisa Boggio, MD; Nisha Kakodkar, MD; Paul Kent, MD; Allen Korenblit, MD; Mindy Simpson, MD
- Pediatric neuroradiologist: Sharon Byrd, MD; Mehmet Kocak, MD
- Pediatric neurosurgeon: Lorenzo Muñoz, MD
- Plastic and reconstructive specialist: Gordon Derman, MD
- Radiation oncologists: Ross Abrams, MD; Aidnag Diaz, MD, MPH

**Pediatric Neurosurgeon**
- Lorenzo Muñoz, MD
- Radiation oncologists: Ross Abrams, MD; Aidnag Diaz, MD, MPH

**Surgical Oncologists**
- Steven Bines, MD; Keith Monson, MD
- Radiation oncologist: Ross Abrams, MD
- Pediatric oncologists: Steven Gitelis, MD; Paul Kent, MD; Allen Korenblit, MD; Mindy Simpson, MD

**Thoracic surgeons:**
Gary Chmielewski, MD; Michael Liptay, MD; Christopher Seder, MD; William Warren, MD

**Lung and Thoracic Tumor Conference**
Thursdays, 10 to 11 a.m.
Janet Wolter, MD, Clinical and Educational Conference Room, 1010 Professional Building
Representative Publications


### 2013 Cancer Registry Report

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<th>PRIMARY SITE</th>
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<th>NONANALYTIC</th>
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**TOTAL:** 2,960 2,494 466 1,214 1,746

Analytic: Cases diagnosed and/or received all or part of first course of care at Rush University Medical Center.

Nonanalytic: Cases diagnosed and all first course treatment completed elsewhere.
NEW CANCER INCIDENCE BY FIRST CONTACT YEAR, 2009 - 2013

ANALYTIC CASE DISTRIBUTION BY GENDER AND AGE AT DIAGNOSIS, 2013

TOP 10 NATIONAL ANALYTIC SITES, 2013

Note: The graph compares USA data with that from Rush for the top 10 national analytic sites.

Note: Data is based on stage as defined by the American Joint Committee on Cancer (AJCC).

TOP 5 RUSH ANALYTIC SITES, 2013

Note: Data is based on stage as defined by the American Joint Committee on Cancer (AJCC).
**COLORECTAL MEASURE RESULTS, 2012**

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<th>MEASURES</th>
<th>DEFINITION</th>
<th>COMMISSION ON CANCER THRESHOLD</th>
<th>2012</th>
<th>CASE REVIEW</th>
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<td>Colon Measure Accountability</td>
<td>Adjuvant chemotherapy is considered or administered within 4 months (120 days) of diagnosis for patients under the age of 80 with AJCC stage III (lymph node positive) colon cancer</td>
<td>90%</td>
<td>100%</td>
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<td>(Adjuvant Chemotherapy)</td>
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<td>Colon Measure Improvement</td>
<td>At least 12 regional lymph nodes are removed and pathologically examined for resected colon cancer</td>
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<td>82%</td>
<td>12 RLN</td>
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<td></td>
<td>(Regional Lymph Nodes)</td>
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<td>Rectal Surveillance</td>
<td>Radiation therapy is considered or administered within 6 months (180 days) of diagnosis for patients under the age of 80 with clinical or pathologic AJCC T4N0M0 or Stage III receiving surgical resection for rectal cancer</td>
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<td>87.5%</td>
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**BREAST MEASURE RESULTS, 2012**

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<th>CASE REVIEW</th>
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<td>Breast Accountability</td>
<td>Radiation therapy is administered within 1 year (365 days) of diagnosis for women under age 70 receiving breast conserving surgery for breast cancer</td>
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<td>BCS</td>
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<td>Breast Accountability</td>
<td>Combination chemotherapy is considered or administered within 4 months (120 days) of diagnosis for women under 70 with AJCC T1c N0 M0, or Stage II or III ERA and/or PRA negative breast cancer</td>
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<td>91.2%</td>
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<td>(Multi-Agent Chemotherapy)</td>
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<td></td>
</tr>
<tr>
<td>Breast Accountability</td>
<td>Tamoxifen or third generation aromatase inhibitor is considered or administered within 1 year (365 days) of diagnosis for women with AJCC T1c N0 M0, or Stage II or III ERA and/or PRA positive breast cancer</td>
<td>90%</td>
<td>98%</td>
<td>HT</td>
</tr>
<tr>
<td></td>
<td>(Hormone Therapy)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast Accountability</td>
<td>Radiation therapy is considered or administered following any mastectomy within 1 year (365 days) of diagnosis of breast cancer for women with ≥ 4 positive regional lymph nodes</td>
<td>90%</td>
<td>93.8%</td>
<td>MASTRT</td>
</tr>
<tr>
<td></td>
<td>(Mastectomy )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast Quality Improvement</td>
<td>Image or palpation-guided needle biopsy (core or FNA) is performed to establish diagnosis of breast cancer</td>
<td>80%</td>
<td>83.4%</td>
<td>NbX</td>
</tr>
</tbody>
</table>

Reached or exceeded Commission on Cancer benchmark.
OBSERVED SURVIVAL FOR COLON CASES DIAGNOSED, 2003 - 2007

CANCER MORTALITY (INPATIENT) AT RUSH, FY14*

<table>
<thead>
<tr>
<th>Division</th>
<th>Observed Mortality Rate</th>
<th>Predicted Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone Marrow Transplant</td>
<td>2.29</td>
<td>1.79</td>
</tr>
<tr>
<td>Medical Oncology</td>
<td>3.69</td>
<td>4.75</td>
</tr>
<tr>
<td>Surgical Oncology</td>
<td>3.36</td>
<td>1.54</td>
</tr>
</tbody>
</table>

* Actual mortality = number of deaths per 100 discharges; predicted mortality = deaths expected based on how sick the patients are, per 100 discharges; mortality index = actual rate/predicted rate (index <1 means fewer patients died than predicted).

Source: University HealthSystem Consortium clinical database, FY 2014 data.
The Rush University Cancer Center comprises all of the cancer-related clinical, research and educational efforts at Rush, crossing 20 departments, divisions and sections; inpatient and outpatient areas; professional clinical activities; and the colleges of Rush University.

For more information about cancer programs at Rush or to refer a patient for an initial visit or a second opinion, please call

(312) CANCER-1 (226-2371).