

2018  
ANNUAL  
REPORT

THE GEORGE WASHINGTON UNIVERSITY  
**CANCER PROGRAM**  
AND **CANCER REGISTRY**

THE GEORGE  
WASHINGTON  
UNIVERSITY  
HOSPITAL  
UHS

THE GEORGE WASHINGTON UNIVERSITY CANCER CENTER

THE GEORGE WASHINGTON UNIVERSITY HOSPITAL

THE GEORGE WASHINGTON MEDICAL FACULTY ASSOCIATES

THE DR. CYRUS AND MYRTLE KATZEN CANCER RESEARCH CENTER

THE GEORGE WASHINGTON SCHOOL OF MEDICINE AND HEALTH SCIENCES

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## A MESSAGE FROM THE DIRECTOR

This past year, I have been heartened by ongoing progress in the fight against cancer. Recent studies have highlighted declining death rates for many common cancer types, including lung, colorectal, breast, and prostate. However, these advances remain uneven for many groups. Here in Washington, D.C., we see firsthand the need for ongoing vigilance in reducing health disparities and working toward health equity on a daily basis.

I often describe the problem of cancer like the chapters of a book. Too often we could devote the majority of our resources and attention to the later chapters of treatment and cure, neglecting investment in the early chapters of education, prevention and screening where we can make the most impact. Here at the George Washington University (GW) Cancer Center, I am proud to say that we've made strides across the cancer care continuum. Whether through research, patient care, clinical trials, or outreach and education, we have continued to break down silos and harness the power of collaboration in our efforts.

This year, we opened the doors of our brand new multi-disciplinary clinical space that serves as a one-stop facility for patients. This new space brings together many of our experts in one location so patients can come to one place to receive the appropriate care that they need. We are also expanding our stem cell transplant and cell therapies program and brought in internationally renowned experts, like Catherine Bollard, MD, and John Barrett, MD, MPH, to lead our efforts in translational research and innovation. We also expanded our leadership team with the appointment of Lorien Abrams, ScD, as interim associate center director for population sciences and policy. I am grateful for her leadership and our continued partnership with the Milken Institute School of Public Health at GW .

Here at the GW Cancer Center we are also committed to training the next generation of researchers and clinicians. In 2018, we launched a new undergraduate summer program to advance cancer research through enhancing diversity in the field. We have also made strides toward ensuring that our medical school curriculum is diverse and culturally sensitive to the needs of patients from all backgrounds and identities. This critical work ensures that our students and future leaders receive the best evidence-based, contemporary training possible.

In 2018, we continued offering regular breast, prostate, colorectal, skin, and lung cancer screenings to patients from across the District and surrounding metropolitan areas. Many of these programs, like the Mammovan, make early detection accessible to underserved communities and break down barriers to lifesaving services. We are also working to ensure that our research efforts and priorities are community-driven and responsive to the needs of the patients we serve.

I am encouraged by the stories of hope I hear from across the GW Cancer Center every day. From the courage of patients and their families, to the generosity of our many donors and supporters, I am humbled and grateful to be a part of this exciting enterprise. It is my hope that you read this report with a similar sense of optimism about the progress we have made over the past year. I look forward to the bright future ahead.

Sincerely,

**Eduardo M. Sotomayor, MD**

Dr. Cyrus Katzen Family Director of the George Washington University Cancer Center  
Professor of Medicine  
George Washington University  
School of Medicine and Health Sciences



## 2018 CHAIRMAN'S REPORT

I am pleased to present the 2018 Annual Report of the Cancer Program for the George Washington University cancer programs. In it you will find information about our efforts in clinical care, research, community outreach, and survivorship. Much has happened in the past year.

Eduardo Sotomayo, MD, was appointed the inaugural Director of the GW Cancer Center in July of 2015. Since then, he has been working diligently to place our center on course to apply for accreditation as an NCI designated Cancer Center. Over the past four years, our basic science productivity (under the leadership of Ed Seto, PhD) has increased significantly.

Our center has already contributed over 500 publications in the past two years.

Our radiation oncology program houses two linear accelerators including the Varian Truebeam STx. The TrueBeam™ system is considered among the most advanced radiotherapy technologies in the world. It provides fast, powerful, non-invasive cancer treatment, with pinpoint accuracy for treating tumors in any area of the body. The new center also has a cutting edge simulator, a new CT scanner, and now offers brachytherapy.

In September 2017, Sharad Goyal, MD, joined Radiation Oncology as its Division Director, and James Rao, MD, arrived in August 2018. Together with Martin Ojong-Ntui, MD, we have an admirable team. Using state-of-the-art technologies, GW radiation oncologists deliver powerful doses of radiation directly to the tumor with exquisite precision. The approaches we use reduce the number of sessions required for radiation treatment in comparison with more conventional approaches, while also limiting side effects.

Over the past two years, our faculty focused on cancer has increased. In medical oncology, we have welcomed Holly Dushkin, MD, for breast and GI cancers; Mitchell Smith, MD, PhD, and Kieron Dunleavy, MD, who are focused on lymphoma, and other hematologic malignancies; Faysal Haroun, MD, who treats lung cancer and myelodysplastic syndromes; and George Kim, MD, who is a GI oncologist. Jianqing Lin, MD, is working closely with several Urologic Oncologists to improve and expand our treatment of prostate cancer, kidney cancer and bladder cancer. John Barrett, MD, has joined Imad Tabbara, MD, and Eric Yvon, MD, to expand our bone marrow transplant program.

We have also welcomed Catherine Bollard, MD, from Children's National Health System. She is a national leader in perfecting the use of immunotherapy, including cellular and CAR-T cell therapy in treating patients with hematologic malignancies. Adam Friedman, MD; Frank Glass, MD; and Vishal Patel, MD, have been recruited and now form the nucleus of Cutaneous Oncology Program that prominently includes cutaneous lymphoma.

Breast imaging and breast surgery services offers digital mammography and 3D ultrasound using the most advanced technology available. Our breast surgeons are able to localize breast tumors using Radioactive Seed Localization instead of the wire-localization procedure of the past. Our breast surgeons work closely with our breast oncologists and plastic surgeons in providing comprehensive care.

The High Risk Breast Clinic (Ruth Paul Hereditary Cancer Clinic), led by Rebecca Kaltman, MD, offers genetic counseling for patients at high risk for developing breast cancer, colon cancer and other hereditary cancer syndromes. In addition to Kaltman, the clinic is staffed by two certified genetic counselors, Elizabeth Stark, MD, and Tara Biagi, MD.

Our head and neck cancer program has expanded to three full time head and neck cancer surgeons, including Arjun Joshi, MD, Punam Thakkar, MD, and Joseph Goodman, MD. Together with Rao in Radiation Oncology and I, we have developed an innovative and less toxic method for treated locally advanced oropharyngeal cancer.

Megan Slocum, PA, has joined our Cancer Center to build a Survivorship program for all malignancies. She is organizing the Survivorship program by across all disciplines and is coordinating her work with Hong Nguyen, our lead Tumor registrar in the hospital.

GW's commitment to physician education includes the Hematology Update each February, an Oncology Update in June and our annual eight-day Best Practices course in August.

GW's Cancer Registry data reveal the number of patients treated at GW with cancer were 1,796. Of these patients, 1,386, or 77%, were diagnosed wand/or treated at GW.

I hope you enjoy reading this report. Please let me know if you have any questions.

Sincerely,

**Robert S. Siegel, MD**  
Professor of Medicine  
Chairman, Cancer Committee

# THE GW DIVISION OF RADIATION ONCOLOGY

## CHIEF'S WELCOME

I would like to personally welcome you to GW radiation oncology, which offers patients access to state-of-the-art therapies delivered in a compassionate, caring environment. We also have a strong commitment to education and research, particularly to developing and implementing advanced radiation technologies.

Our radiation oncologists are committed to the practice of evidence-based medicine and continually find new and better treatment options that improve patient outcomes in the treatment of cancer. Our team works to offer the highest level of safety during every step of treatment. We collaborate closely with highly trained medical physicists in subspecialized teams to create an individualized radiation treatment plan for every patient. Radiation therapists are present during each radiation procedure to ensure that the correct dose of radiation is being delivered precisely where it's needed.

The outstanding faculty and staff, combined with GW's extensive collection of advanced technology, gives patients access to nearly every treatment option available for their cancer. The broad range of radiation treatments available at GW include Intensity Modulated Radiation Therapy, Image Guided Radiation Therapy, 3D conformal radiation therapy, Stereotactic Radiosurgery, Stereotactic Body Radiation Therapy, and Brachytherapy.

GW radiation oncology is also committed to enhancing and improving upon the patient experience by providing a full range of clinical services and supportive programs. An integral component of the GW School of Medicine and Health Sciences and the GW Cancer Center, GW Radiation Oncology draws upon the center's full resources to deliver the best possible comprehensive care. At GW, we find strength in our colleagues, with whom we work closely to design, optimize, and implement patient-individualized radiation therapy treatments. These partners include our world-class specialists in surgical oncology, medical oncology, gynecologic oncology, neurosurgery, diagnostic radiology, and interventional radiology.

Finally, we believe that patients will receive the best radiation high quality therapy treatment and clinical care at GW that compares favorably to any institution in the country. Our promise to each patient is that we will deliver cancer care that is second to none. We hold ourselves to this standard each and every day with the goal of improving our patient's treatment outcomes.

Sincerely,

**Sharad Goyal, MD**

Professor of Radiology

Chief, Division of Radiation Oncology



### GW HEALTH VILLAGE

Over the weekend of Jan. 12-13, 2019, visitors toured the GW Health Village at the NBC4/Telemundo44 Health and Fitness Expo. Volunteers from the George Washington University (GW) Hospital, the GW Medical Faculty Associates, and the GW School of Medicine and Health Sciences, as well as the GW Ron and Joy

Paul Kidney Center and the GW Cancer Center, were on hand.

About 1,000 people received blood pressure, BMI, and diabetes screenings, and also took advantage of the opportunity to receive wound care and foot and ankle consultations.



### GENETIC JUNK IS TOO GOOD TO THROW AWAY

Less than 3 percent of the DNA in our genome encodes proteins. Recent work has shown that a significant part of the genome, initially considered “junk DNA,” does not code for proteins, but still has important biological functions, especially in cancer initiation and progression. A two-year, \$300,000 grant from the G. Harold and Leila Y. Mathers Foundation will help fund research led by Katherine Chiappinelli, PhD, assistant professor of microbiology, immunology, and tropical medicine at SMHS, to define epigenetic determinants of repetitive element “junk DNA” control during tumor progression and lay the groundwork for understanding interactions between these elements and the host immune system.

The research project, titled “Epigenetic Modification and Expression of Retroelements in Cancer

Development,” includes a subcontract with Kathleen Helen Burns, MD, PhD, at Johns Hopkins Medicine, an expert in the field of repetitive elements in cancer. Repetitive elements are very different in cancer cells than they are in normal cells, but the medical community does not yet know which elements are affected and how they are altered as the cancer progresses. Outcomes of the project will include a more complete understanding of cancer progression and the identification of novel cancer therapeutic targets and/or biomarkers.

Chiappinelli and her colleagues will work to produce a comprehensive map of repetitive element regulation and expression during the progression of common tumors, including lung and ovarian cancer.

## BUILDING A BIGGER BMT PRESENCE

The George Washington University (GW) Cancer Center has assembled an internationally recognized team of experts to bring innovative and cutting-edge cell-based therapy options to patients in the Washington, D.C., area.

John Barrett, MD, professor of medicine at the GW School of Medicine and Health Sciences, heads up the bone marrow transplant and cell therapies (BMT) expansion at the GW Cancer Center, including the translation of clinical research efforts into novel immune cell treatments. Barrett previously served as chief of the Stem Cell Transplantation Section of the hematology branch of the National Heart, Lung, and Blood Institute, where he began the stem cell transplant program.

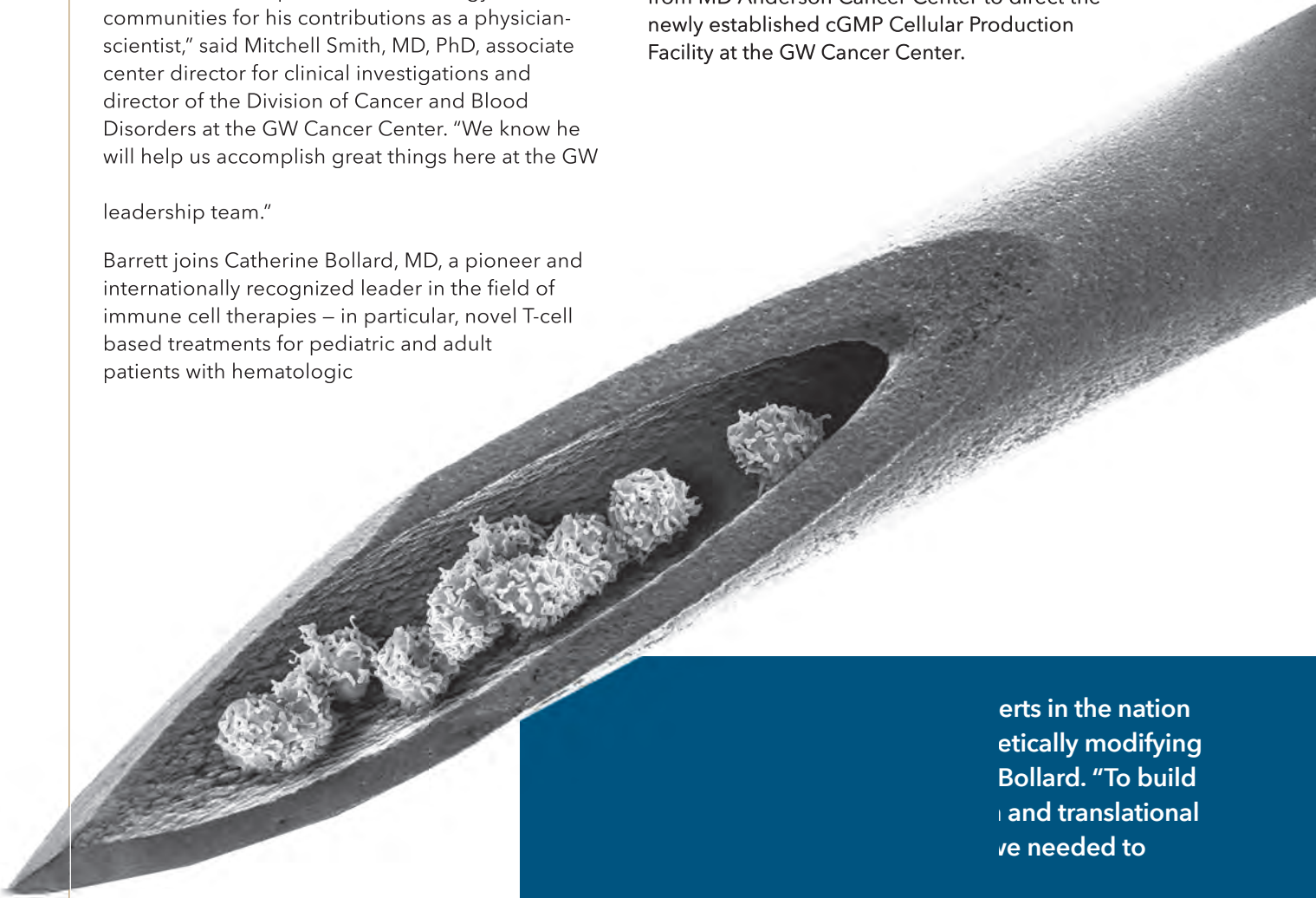
“Dr. Barrett is known and respected throughout the international transplant and hematology communities for his contributions as a physician-scientist,” said Mitchell Smith, MD, PhD, associate center director for clinical investigations and director of the Division of Cancer and Blood Disorders at the GW Cancer Center. “We know he will help us accomplish great things here at the GW

leadership team.”

Barrett joins Catherine Bollard, MD, a pioneer and internationally recognized leader in the field of immune cell therapies – in particular, novel T-cell based treatments for pediatric and adult patients with hematologic

malignancies. Bollard, associate center director for translational research and innovation at the GW Cancer Center, also serves as the director of the Center for Cancer and Immunology Research at the Children’s Research Institute and is a member of the Division of Blood and Marrow Transplantation at Children’s National Health System.

When Eduardo M. Sotomayor, MD, director of the GW Cancer Center and professor of medicine, joined the GW School of Medicine and Health Sciences in 2015, it didn’t take long for him to pick Bollard out from the crowd. “I realized then that together with Bollard, we would be able to build a world-class program in immune cell-based therapies ... which is happening now,” said Sotomayor. Bollard, he added, played a key role in the recruitment of Eric Yvon, PhD, who came to GW from MD Anderson Cancer Center to direct the newly established cGMP Cellular Production Facility at the GW Cancer Center.



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### SURVIVORSHIP E-LEARNING SERIES

The George Washington University (GW) Cancer Center offers The Cancer Survivorship E-Learning Series for Primary Care Providers (E-Learning Series), a free, self-paced continuing education program for primary care providers interested in learning more about the needs of post-treatment cancer survivors.

The module-based, online format prepares physicians to care for, and attend to, the needs of cancer survivors by providing cancer specific guidelines for colorectal, breast, head and neck, and prostate cancer survivors. The e-learning series offers access to the latest practice-based insights and experiences from cancer survivors. The self-paced modules typically

take an hour, but they can be completed in as many sittings as necessary, enabling health care providers to earn continuing education credits at their own pace.

The E-Learning Series is a program of the National Cancer Survivorship Resource Center, a collaboration between the American Cancer Society and the GW Cancer Center funded through a five-year cooperative agreement with the Centers for Disease Control and Prevention.

For more information or to enroll in the training, visit [cancercenter.gwu.edu/for-health-professionals](http://cancercenter.gwu.edu/for-health-professionals).



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SURVIVORS



# THE DR. CYRUS AND MYRTLE KATZEN CANCER RESEARCH CENTER 2018

## **Leo Schargorodski**

Executive Director

Dr. Cyrus and Myrtle Katzen Cancer Research Center (Katzen Center) at the GW Medical Faculty Associates (MFA) was established in 2009 by a generous donation from Cyrus Katzen, DDS, and his wife, Myrtle. The center brings the most up-to-date technology and treatment options to patients being served by the GW Medical Center. The center features an "inspired by nature" organic design to create a calming, healing environment for patients receiving treatment. The center has enabled GW to offer new therapies to more patients and to expand the nursing team to attend to the vast needs of patients. The center also offers patients a relaxing, healing atmosphere as they receive what can be exhausting treatment.

In 2018, the center offered new expanded facilities on the ground floor of the GW MFA Ambulatory Care Center which brings 4,600 square feet of additional space for cancer patients, dedicated primarily for solid tumor cancer treatment. Together with existing cancer resources on the first floor which are dedicated as the infusion space and the malignant hematology clinic for leukemia, lymphoma, and myeloma patients, the new clinical facility added 16 exam rooms, one procedural room and a pair of consultation rooms that also are used for clinical research discussions.

With a continued strong focus on Innovative Cancer Pilot Research Grants, the following grants were awarded in 2018.

### **Rebecca Kaltman, MD "Cancer Telegenetics for Underserved Women in the D.C. Area: An Innovative Approach to Address Health Disparities."**

(Aim 1.) To identify multi-level barriers to implementation of telegenetic counseling (genetic counseling via live videoconferencing) and testing for hereditary cancer at a Hispanic-serving community clinic in the Washington, D.C., area. (Aim 2.) To adapt commonly used screening tools for the Spanish-speaking population and to evaluate the cultural sensitivity of telegenetic counseling as compared to in-person genetic counseling and testing of the Hispanic population. (Aim 3.) To compare the use of an iPad (Spanish or English with facilitated translation into Spanish) with a paper-based (Spanish) hereditary cancer screening tool adapted from National Comprehensive Cancer Network (NCCN)

Guidelines for Further Genetic Risk Evaluation to identify appropriate individuals for cancer genetic counseling.

### **Erik Rodriguez, PhD "Tools to Image and Treat Cancer."**

Tools that can image early stage cancer in humans have a vital role for the precise removal and treatment of cancer after early detection. (Aim 1) Using the removed cells would be advantageous for developing personalized postoperative treatment for patients. (Aim 2) The long term goal for this research is to use our evolved fluorescent protein to create nanoparticles for cancer imaging and treatment in humans (Aim 1) and image the cell cycle of cancer cells, removed from a patient, to screen drugs for personalized postoperative treatment (Aim 2). We envision these aims as being synergistic with early detection in a three pronged approach: 1) Cancer is detected early, 2) Our tools are used to guide the clinician for removal and/or treatment of very small tumors not amenable for surgery (Aim 1), and (Aim 3) Removed cancer cells are genetically encoded with our cell cycle indicator to screen drug therapy for personalized medicine approach to postoperative treatment (Aim 2). The objective for this application is to create nanoparticles for imaging and treatment (Aim 1) and genetically placing fluorescent cell cycle indicators in human cancer cells and test FDA approved cancer drugs as diagnostics for the screen.

### **Avi Dor, PhD "Impact of Policy and System Interventions on HPV Vaccination and Incidence of Cervical Cancer."**

The research objective of this project is to investigate two different methods of promoting Human Papillomavirus (HPV) vaccination for the purpose of cervical cancer prevention: physician recommendations and public health policies enacted by states. Accordingly, we will provide estimates of the influence of physician recommendations on HPV vaccine uptake, and compare the effect with public policies (e.g. legal mandates, educational requirements) promoting HPV vaccination. We will also study the potential impact of physician recommendations on racial and ethnic disparities in HPV vaccination rates, and downstream cervical cancer incidence and mortality.

# THE DR. CYRUS AND MYRTLE KATZEN CANCER RESEARCH CENTER 2018

## Leo Schargorodski

Executive Director

### Inhee Chung, PhD "Integrated 3D Cellular Imaging Platform for Assessing Cancer Dissemination Potential."

Cancer cells undergo drastic changes as they become metastatic. These changes include biophysical alterations of the plasma membrane that weaken the interactions between the cell surface and the surrounding environment and thus promote dissemination. Detecting such changes can provide prognostic indicators of cancer dissemination, and uncovering the underlying molecular mechanisms may lead to development of novel anti-metastatic therapeutic strategies. However, the biophysical signatures of disseminating cancer cells are difficult to identify and measure, and dissection of the molecular mechanisms that drive these processes is challenging with currently available methods. In this proposal, we aim to construct novel optical imaging and analysis tools that can identify and quantify the pro-dissemination biophysical changes that occur at the cell surface. The proposed technologies will provide a foundation for future mechanistic studies to validate membrane remodeling as a biomarker for metastatic potential.

### Total Amount of Funding Granted: \$174,529.44

The **Patient Assistance Fund** continued to address the following needs:

- Out-of-pocket expenses and medical supplies: 1) Chemotherapy, biotherapy, or other cancer-related infusion co-payments; 2) Assistance with prescription costs and office visit co-payments; 3) Medical equipment and mastectomy apparel; 4) Deductibles, co-insurance; and 5) Travel and parking expenses.
- Patient Navigation: Cancer treatment centers often include social workers and patient navigation to assist patients with care coordination to successfully navigate the health care system. Patient navigators have been shown to provide for better and more consistent outcomes for patients and positively impact cancer survivorship.
- Infusion Programs: Many patients have to spend 3-6 hours at a time receiving infusion. Some do this every three weeks, some once a week, and some three or four times a week. To help make the environment as welcoming and comfortable as possible, we now offer massage therapy for patients. We also started a pet therapy program whereby therapy dogs

visit our infusion center twice a week. Finally, we provide laptop computers to our patients so they can watch movies or catch up with friends over email.

- Holistic, Wellness and Support Services: The Center hosted support groups and patient services. These groups are open to all cancer patients in the Washington, D.C., metropolitan area. These classes include the following:
  - 1) Chemo Class for new infusion patients;
  - 2) Active Treatment Support Group;
  - 3) Caregiver Support Group;
  - 4) Kids Club - support groups for children of cancer patients;
  - 5) Prostate Cancer Support Group - for men, their families and significant others;
  - 6) Washington, D.C., Metropolitan Area Brain Tumor Support Group;
  - 7) Young Adult Group - young patients age 18-39;
  - 8) Multiple Myeloma Support Group for Patients and Family Members;
  - 9) Yoga for Cancer Patients;
  - 10) Survivorship Series: nutrition for the cancer patient, anxiety and depression;
  - 11) Changes in Relationships, Covering the Cost of Treatment and Returning to work;
  - 12) Gynecological Support Group; and
  - 13) Head and Neck Support Group.

### Convening of nine Mid-Atlantic Consortium dinner meetings for physicians and surgeons on the topics of breast cancer, lung cancer, radiation oncology, and hematology in 2018

The Mid-Atlantic Hematology Consortium, the Mid-Atlantic Breast Cancer Consortium, and the Mid-Atlantic Lung Consortium are presented by the Katzen Cancer Research Center to inform oncology physicians, surgeons and radiologists in the metropolitan Washington, D.C., area (Maryland, Virginia, and Washington, D.C.) of the most recent advances in cancer research and its application to surgery and treatment. At these meetings local physicians and surgeons are asked to focus on the latest cutting-edge information through case studies and discussion of treatments. Clinicians also present recommendations at round-table discussion groups.

# THE DR. CYRUS AND MYRTLE KATZEN CANCER RESEARCH CENTER 2018

## Leo Schargorodski

Executive Director

The consortiums provide a common forum for oncology physicians and surgeons to take collective action. Members assess changing cancer needs and share resources and knowledge with one another. Ultimately, consortium members do more together than they ever could by working on their own.

Occurring nearly every month throughout the year, the breast, lung, and hematology consortiums take advantage of the latest information being presented at national meetings and symposiums. In this way, the local physicians can be introduced to the most current concepts, treatments and medications. And by sharing with their counterparts in other hospitals, potentially change the standard of care for the benefit of cancer patients throughout the Metropolitan Washington area.

### Hematology Update, Oncology Update and Best Practices Conferences

The Dr. Cyrus and Myrtle Katzen Cancer Research Center participates in the production of three major professional educational opportunities each year.

The **Hematology Update** takes place on the last Saturday of February each year. This meeting offers practicing clinicians the most recent abstracts and guidelines presented at the recent major Hematology meetings. The seven faculty experts deliver the most relevant, cutting-edge science in hematology today and offer practical tools to help them incorporate these advances into their clinical practice. The meeting content is designed for clinicians involved in multidisciplinary hematology and oncology care, including but not limited to hematologists, oncologists; internal medicine physicians; nurses; physician assistants; and other health care professionals.

The **Oncology Update**, occurring on the last Saturday in June each year offers practicing clinicians the most recent abstracts and guidelines presented at the recent major oncology meetings. The faculty experts deliver the most relevant, cutting-edge science in oncology today and offer practical tools to help incorporate these advances into their clinical practice. The meeting content is designed for clinicians involved in multidisciplinary hematology and oncology care including but not limited to hematologists, oncologists, internal medicine physicians, nurses, physician assistants, and other health care professionals.

The **Hematology and Medical Oncology Best Practices Course** is an important element in the continuum of physician performance improvement over time. The course is in its 37th year and is one of the most well-respected and longest-running courses covering hematology and medical oncology. With over 400 practicing clinicians attending each year, it is also the largest combined hematology and medical oncology course in the United States. It takes place the third week of August each year for eight consecutive days.

Course Director Robert S. Siegel, MD, associate clinical director for education, training, and outreach, is joined by a faculty of 50 leading experts in hematology and medical oncology.

Topics to be covered include:

- Anemias
- Breast cancer
- Clotting and bleeding disorders
- Gastroenterological cancers
- Genitourinary cancers
- Leukemias/lymphomas/multiple myeloma
- Lung cancer
- Melanoma
- Mesothelioma
- Myelodysplasia
- Myeloproliferative disease
- Pharmacology
- Platelet disorders
- Solid Tumors
- Sarcomas
- Palliative care

# RADIATION TIME OUT – 2018 STUDY

**By Sharad Goyal, MD**

Professor of Radiology  
Chief, Division of Radiation Oncology

Communication failures are an ongoing threat to patient safety. Before any patient undergoes a radiation procedure in one of GW's radiation oncology facility, the team stops for a Time-Out. No, they are not taking a break on the job. Rather, they are pausing to ensure they have the correct patient, correct procedure, and correct site for every case, every time. The Time-Out is a deliberate pause in activity involving clear communication and verbal confirmation. All members of the radiation oncology team participate in the Time-Out process. It is just one element of Universal Protocol, designed to ensure that the appropriate steps are taken prior to operations and other invasive procedures.

Procedural Time-Outs were developed as a method to enhance communication and mitigate patient harm. It is important that we work on this now so that we prevent any sentinel events, radiation therapy errors, near misses, or unnecessary complications to the radiation oncology patient. The purpose of this quality improvement project was to stress the importance of the radiation therapy time out, uncover the root analysis for faulty performance, and to implement change that will lead to correct performance.

We started our project in January 2018 by reviewing radiation records between August 2016 and August 2017. During that period we were at a 70% compliance rate and set our ultimate goal of 100% compliance to be seen in August 2018, a 6-month overall time span. Although 100% compliance may not seem to be a realistic goal right off the bat, we did expect to see an increase in compliance as we began our intervention. It was apparent that Time-Outs were being performed, but not documented.

The primary intervention was performed at the radiation oncology morning huddle. In this daily meeting, we included a brief reminder to be conscious about the days' Time-Outs and performing documenting them correctly, positively recognizing staff that has consistently followed correct procedure, and a reminder of our 100% compliance goal. Through this intervention, in a 6-month time frame, we improved the compliance rate to 93%. Through this effort, we are able to build a system that supports a positive safety culture and encourages teamwork and direct communication.



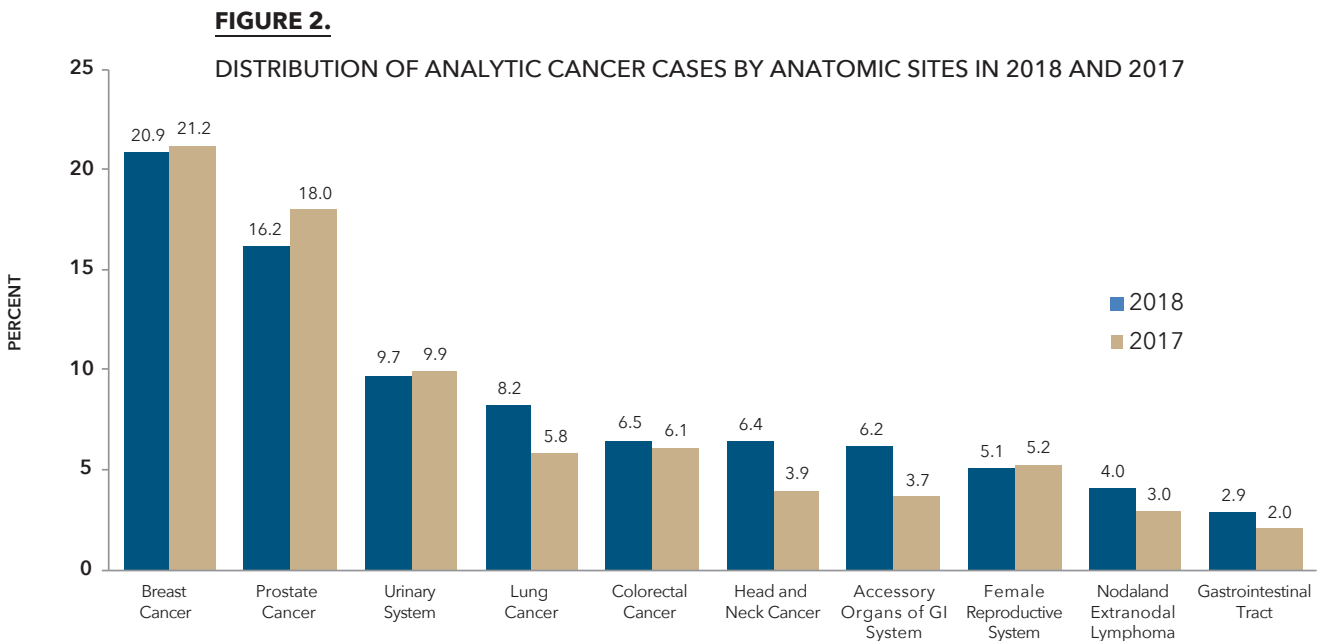
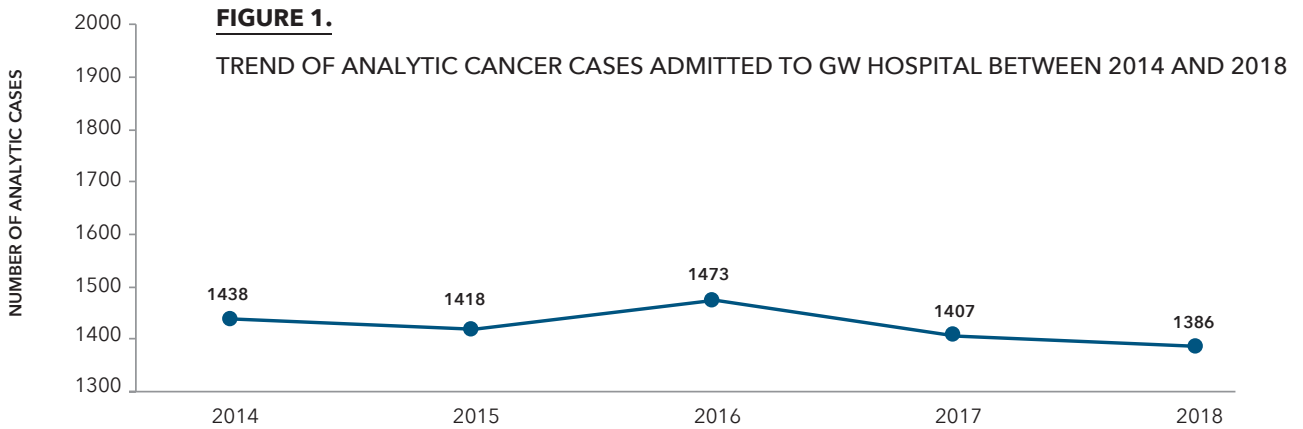


# 2018 GW HOSPITAL CANCER REGISTRY

## CANCER DATA REPORT

The GW cancer registry has been growing consistently for the past five years between 2014 and 2018 (*Figure 1*). The number of patients admitted to GW Hospital was 1,796 cases in 2018. Out of these cases, 1,386 cases (77%) were diagnosed and/or treated (analytic cases) at GW (*Table 1*).

As shown in *Figure 2*, breast, lung, prostate, colon, and kidney cancers remain as major cancer sites at GW Hospital. Compare the cancer cases between 2018 and 2017, there was a significant increase in cancer cases of lung (8.2 vs. 5.8), head/neck (6.9 vs. 3.9); accessory gastrointestinal organs like liver and pancreas (6.2 vs. 3.7). There was a slightly increase in cancer cases of gastrointestinal tract (2.9 vs. 2.0), lymphoma (4.0 vs. 3.0), and colorectal cancer (6.5 vs. 6.1).



**TABLE 1: THE GEORGE WASHINGTON UNIVERSITY HOSPITAL  
2018 CANCER CASES BY ANATOMIC SITES**

Primary site	# Cases	% Cases	Analytic Cases Only		Race*** (Analytic Cases Only)				AJCC Stage at Diagnosis (Analytic Cases Only)					
			# Cases	% Cases	W	B	O	0	I	II	III	IV	88	UNK
<b>Head and Neck</b>	<b>106</b>	<b>5.9</b>	<b>88</b>	<b>6.4</b>	<b>49</b>	<b>21</b>	<b>18</b>	<b>1</b>	<b>18</b>	<b>14</b>	<b>15</b>	<b>31</b>	<b>5</b>	<b>4</b>
Tongue	21	1.1	18	1.3	10	2	6	0	3	2	3	9	0	1
Salivary Gland	12	0.7	9	0.6	7	1	1	0	0	3	0	5	0	1
Floor of Mouth	9	0.5	6	0.4	4	1	1	0	2	0	1	3	0	0
Gum and Palate	7	0.4	7	0.5	1	2	4	0	0	1	0	3	2	1
Tonsil	17	1.0	14	1.0	9	2	3	0	6	4	2	1	1	0
Nasopharynx	3	0.2	3	0.2	0	2	1	0	0	0	3	0	0	0
Oropharynx	2	0.1	2	0.2	1	1	0	0	0	0	0	0	1	1
Hypopharynx	4	0.2	4	0.3	1	3	0	0	0	0	2	2	0	0
Nose/Nasal cavity	3	0.2	2	0.2	2	0	0	0	0	1	0	0	1	0
Sinus	4	0.2	2	0.2	2	0	0	0	0	0	0	2	0	0
Larynx	24	1.3	21	1.5	12	7	2	1	7	3	4	6	0	0
<b>Digestive System</b>	<b>252</b>	<b>14.0</b>	<b>216</b>	<b>15.6</b>	<b>78</b>	<b>110</b>	<b>28</b>	<b>2</b>	<b>47</b>	<b>43</b>	<b>42</b>	<b>49</b>	<b>23</b>	<b>10</b>
Esophagus	16	0.	14	1.0	7	7	0	0	1	2	3	6	1	1
Stomach	15	0.9	14	1.0	2	7	5	1	6	1	0	3	1	2
Small intestine	9	0.6	9	0.7	3	6	0	0	0	1	3	1	3	1
Colon	63	3.5	47	3.4	18	22	7	1	13	14	7	8	4	0
Rectosigmoid Junction	7	0.3	7	0.5	1	3	3	0	0	3	3	1	0	0
Rectum	22	1.2	19	1.4	8	10	1	0	4	2	7	5	0	1
Anus/Anal canal	18	1.0	17	1.2	6	11	0	0	4	4	7	2	0	0
Liver/Intrahepatic duct	33	1.8	31	2.2	12	16	3	0	9	5	3	3	10	1
Gallbladder	3	0.2	2	0.1	0	2	0	0	0	1	0	1	0	0
Extrahepatic duct	1	0.1	0	0.0	0	0	0	0	0	0	0	0	0	0
Pancreas	61	3.3	53	3.9	20	24	9	0	10	10	9	19	1	4
Other digestive organs	4	0.2	3	0.2	1	2	0	0	0	0	0	0	3	0
<b>Respiratory System</b>	<b>134</b>	<b>7.5</b>	<b>118</b>	<b>8.5</b>	<b>48</b>	<b>62</b>	<b>8</b>	<b>0</b>	<b>40</b>	<b>14</b>	<b>16</b>	<b>39</b>	<b>3</b>	<b>6</b>
Main bronchus	2	0.1	1	0.1	1	0	0	0	0	0	1	0	0	0
Lung	127	7.1	113	8.1	44	61	8	0	37	14	14	39	3	6
Thymus/Mediastinum	5	0.3	4	0.3	3	1	0	0	3	0	1	0	0	0
<b>Bones</b>	<b>4</b>	<b>0.2</b>	<b>4</b>	<b>0.3</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>
<b>Soft Tissue</b>	<b>15</b>	<b>0.8</b>	<b>13</b>	<b>0.9</b>	<b>5</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>8</b>	<b>0</b>
Peritoneum	2	0.1	2	0.2	1	0	1	0	1	0	1	0	0	0
Connective tissues	13	0.7	11	0.7	4	6	1	0	0	0	2	1	8	0
<b>Breast</b>	<b>326</b>	<b>18.2</b>	<b>289</b>	<b>20.9</b>	<b>127</b>	<b>140</b>	<b>22</b>	<b>68</b>	<b>143</b>	<b>38</b>	<b>18</b>	<b>16</b>	<b>1</b>	<b>5</b>
<b>Female Genital</b>	<b>111</b>	<b>6.2</b>	<b>70</b>	<b>5.2</b>	<b>18</b>	<b>37</b>	<b>15</b>	<b>0</b>	<b>29</b>	<b>2</b>	<b>15</b>	<b>12</b>	<b>7</b>	<b>5</b>
Vulva /Vagina	5	0.3	5	0.4	0	5	0	0	2	1	0	0	1	1
Cervix Uteri	35	1.9	5	0.4	2	2	1	0	3	0	0	1	0	1
Corpus Uteri	43	2.4	37	2.7	9	22	6	0	20	0	8	4	3	2
Ovary	19	1.1	17	1.2	4	6	7	0	3	1	5	7	1	0
Other Female Genitalia	9	0.5	6	0.5	3	2	1	0	1	0	2	0	2	1

**TABLE 1: THE GEORGE WASHINGTON UNIVERSITY HOSPITAL  
2018 CANCER CASES BY ANATOMIC SITES**

Primary site	# Cases	% Cases	Analytic Cases Only		Race*** (Analytic Cases Only)				AJCC Stage at Diagnosis (Analytic Cases Only)					
			# Cases	% Cases	W	B	O	0	I	II	III	IV	88	UNK
<b>Prostate</b>	<b>244</b>	<b>13.6</b>	<b>224</b>	<b>16.2</b>	<b>121</b>	<b>82</b>	<b>21</b>	<b>0</b>	<b>34</b>	<b>81</b>	<b>73</b>	<b>15</b>	<b>1</b>	<b>20</b>
<b>Male Genital</b>	<b>14</b>	<b>0.8</b>	<b>13</b>	<b>0.9</b>	<b>6</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>
Penis/Other	6	0.3	5	0.4	0	3	2	0	0	4	0	0	0	0
Testis	8	0.5	8	0.5	6	2	0	1	5	1	0	1	1	0
<b>Urinary System</b>	<b>145</b>	<b>8.0</b>	<b>135</b>	<b>9.7</b>	<b>64</b>	<b>57</b>	<b>14</b>	<b>22</b>	<b>59</b>	<b>11</b>	<b>15</b>	<b>15</b>	<b>6</b>	<b>7</b>
Kidney	76	4.2	74	5.3	32	36	6	0	50	3	9	10	1	1
Renal Pelvis	9	0.5	8	0.5	5	2	1	0	0	1	2	1	1	3
Ureter	5	0.3	5	0.4	2	1	2	1	1	1	0	2	0	0
Urinary bladder	53	2.9	46	3.3	25	17	4	21	8	6	4	2	3	2
Urethra	2	0.1	2	0.2	0	1	1	0	0	0	0	0	1	1
<b>Brain / CNS</b>	<b>54</b>	<b>3.0</b>	<b>46</b>	<b>3.3</b>	<b>21</b>	<b>13</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>46</b>	<b>0</b>
Meninges	14	0.8	11	0.8	5	3	3	0	0	0	0	0	11	0
CNS	34	1.9	31	2.2	15	8	8	0	0	0	0	0	31	0
PNS	6	0.3	4	0.3	1	2	1	0	0	0	0	0	4	0
<b>Endocrine System</b>	<b>40</b>	<b>2.2</b>	<b>35</b>	<b>2.5</b>	<b>18</b>	<b>9</b>	<b>8</b>	<b>0</b>	<b>17</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>4</b>
Thyroid	32	1.7	27	2.0	14	5	8	0	17	4	0	0	2	4
Other endocrine glands	8	0.5	8	0.5	4	4	0	0	0	0	0	0	8	0
<b>Lymphoma</b>	<b>67</b>	<b>3.7</b>	<b>59</b>	<b>4.2</b>	<b>29</b>	<b>24</b>	<b>6</b>	<b>0</b>	<b>21</b>	<b>12</b>	<b>5</b>	<b>14</b>	<b>1</b>	<b>6</b>
Hodgkin's	9	0.5	7	0.5	6	1	0	0	3	2	0	1	0	1
Non Hodgkin's	58	3.2	52	3.7	23	23	6	0	18	10	5	13	1	5
<b>Blood</b>	<b>31</b>	<b>1.7</b>	<b>26</b>	<b>1.9</b>	<b>9</b>	<b>14</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>0</b>
Multiple myeloma	13	0.7	10	0.7	4	6	0	0	0	0	0	0	10	0
Chronic leukemia	4	0.2	4	0.3	0	4	0	0	0	0	0	0	4	0
Acute leukemia	7	0.4	7	0.5	3	3	1	0	0	0	0	0	7	0
Other blood disorders	7	0.4	5	0.4	2	1	2	0	0	0	0	0	5	0
<b>Skin</b>	<b>236</b>	<b>13.1</b>	<b>37</b>	<b>2.7</b>	<b>22</b>	<b>5</b>	<b>10</b>	<b>13</b>	<b>12</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>2</b>
Melanoma	31	1.7	29	2.1	14	5	10	13	12	2	0	0	0	2
Other carcinoma	205	11.4	8	0.6	8	0	0	0	0	0	0	0	8	0
<b>Unknown</b>	<b>17</b>	<b>0.9</b>	<b>13</b>	<b>0.9</b>	<b>6</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>0</b>
<b>GRAND TOTAL</b>	<b>1796</b>	<b>100.0</b>	<b>1386</b>	<b>100.0</b>	<b>622</b>	<b>593</b>	<b>171</b>	<b>107</b>	<b>425</b>	<b>226</b>	<b>202</b>	<b>193</b>	<b>164</b>	<b>69</b>

**NOTE:**

- \* Analytic - diagnosed only (class 0) or initially diagnosed at GW Hospital and all or part of first course of therapy at GW Hospital (class 1) or case diagnosed elsewhere and all or part of first course of therapy at GW Hospital (class 3)
- \*\* Non-analytic case - initially diagnosed and treated elsewhere, referred to GW Hospital for recurrence or subsequent therapy and physician office cases
- \*\*\* Race - W=White; B=Black; O=Other
- AJCC Staging at Diagnosis is either clinical or pathological staging. For urinary bladder cancer, stage 0 includes 0a and 0is.

# AUTOMATED BREAST ULTRASOUND (ABUS) REDUCES CALL BACK RATE IN DENSE BREAST SCREENING

**By Rachel Brem, MD, FACR, FSBI**

Professor and Vice-Chair  
 Director, Breast Imaging and Interventional Center  
 Department of Radiology  
 Breast Cancer Program Leader

	2012	2013	2014	2015	2016	2017
<b>Jan</b>	n/a	26/85	32/62	7/18	4/12	8/49
<b>March</b>	1/1	16/40	18/36	8/28	16/40	7/38
<b>May</b>	18/30	24/51	20/48	7/30	10/26	10/47
<b>July</b>	5/8	31/66	3/7	11/25	3/9	8/37
<b>Sept</b>	17/46	28/71	9/34	8/37	12/29	3/19
<b>Nov</b>	33/80	24/63	10/23	9/31	12/43	6/35
<b>Total</b>	<b>151/399 (38%)</b>	<b>276/728 (38%)</b>	<b>193/417 (46%)</b>	<b>116/380 (31%)</b>	<b>108/354 (31%)</b>	<b>88/448 (20%)</b>

Breast cancer is the most common solid cancer in women and the second most common cause of cancer deaths in women in the United States. The situation in Washington, D.C., is even more significant with the city having the highest death rate from breast cancer in the country, by A LOT! The good news is that over the past two decades the death rate from breast cancer has decreased by 40% with significant contributions from both early detection and improved therapies contributing to this. Therefore, there is no-where that it is more imperative that we do all we can to impact the unacceptable death rate from breast cancer than here in the D.C. area.

Screening mammography is a powerful tool in the reduction of the mortality from breast cancer, however in women with dense breast tissue mammography may not be enough. Women with dense breast tissue have up to a 4-fold increase risk of developing breast cancer, with all other factors being accounted for. In addition, mammography in women with dense breast tissue is less effective in finding breast tissue since breast tissue is white and breast cancer is white on the mammogram, so the loss of the contrast makes detection of breast cancer more difficult. In fact, mammograms can detect 85% of all breast cancers in women, but in women with dense breast tissue that decreases to 65%, i.e. nearly 1/3 of breast cancers are not visible on mammography in women with dense breast tissue. This is not only a medical issue but a political issue as well. More than 35 states, and recently the District of Columbia, have enacted laws that require women be informed about their breast density and that additional tests can find

these cancers that are hidden in mammograms in women with dense breast tissue. However, there is something that can be done to detect this cancer that cannot be seen on mammograms in women with dense breast tissue and that is additional testing. These tests include screening ultrasound, MRI, and molecular breast imaging (MBI). At GW we have implemented additional screening with automated breast ultrasound (ABUS) for nearly a decade. One of the greatest criticism of ABUS screening is the false positive call back rate from the examination, meaning that the study finds lesions that need to be addressed that turn out to be benign (not cancer). One of the studies we undertook is how to minimize the false positive call back rate, and therefore make ABUS an even more powerful tool. We have learned a great deal since implementing our ABUS program both in detecting these early, often curable breast cancer that are otherwise hidden in mammograms and how to decrease our call back rate (false positive) by recognizing over time which findings are significant and which are not. In order to evaluate how effective we have been, we undertook investigating our ABUS call back rate over time.

Our study has found that the call back rate has significantly decreased. When our ABUS program was initiated the call back rate was 38% in 2012. We have found over six years that the call back rate has significantly decreased to 20% in 2017. Now we can harness the power of ABUS in finding small, node negative, invasive cancers that were not visible on mammography with a markedly decreased call back rate.



## RESOURCES AND SUPPORT

# THE GEORGE WASHINGTON UNIVERSITY AND GW CANCER CENTER RESOURCES

### **The George Washington University Hospital**

900 23rd St., N.W. Washington, D.C. 20037  
(202) 715-4000 1-888-4GW-DOCS  
www.gwhospital.com

### **The GW Medical Faculty Associates**

2150 Pennsylvania Ave., N.W.  
Washington, D.C. 20037  
(202) 741-3000  
www.gwdocs.com

### **Institute for Patient-Centered Initiatives and Health Equity**

2600 Virginia Ave. NW, Suite 300  
Washington, D.C. 20037  
(202) 994-2449  
gwcancercenter.com

### **The Dr. Cyrus and Myrtle Katzen Cancer Research Center**

2150 Pennsylvania Ave., N.W., Suite 1-200  
Washington, D.C. 20037  
(202) 741-2250  
www.katzencancer.org

### **The GW Comprehensive Breast Center**

2300 M St., N.W., 8th Floor  
Washington, D.C. 20037  
(202) 741-3270

### **Cancer Registry**

900 23rd St., N.W. Washington, D.C. 20037  
(202) 715-4383

### **Clinical Oncology**

2150 Pennsylvania Ave., N.W., 3rd Floor  
Washington, D.C. 20037  
(202) 741-2210

### **Hematology/Oncology**

2150 Pennsylvania Ave., N.W., 3rd Floor  
Washington, D.C. 20037  
(202) 741-2210

### **Pain Management Center**

2131 K St., N.W. Washington, D.C. 20037  
(202) 715-4599

### **Pathology**

900 23rd St., N.W. Washington, D.C. 20037  
(202) 715-4665

### **Cancer Survivorship Clinic**

22nd & I streets, N.W.  
4th Floor Washington, D.C. 20037  
(202) 741-2222

### **Mobile Mammography Program**

2150 Pennsylvania Ave., N.W.,  
D.C. Level Washington, D.C. 20037  
(202) 741-3020

### **Radiation Oncology**

725-A 23rd St., N.W.  
(at the corner of H and 23rd streets)  
Washington, D.C. 20037  
(202) 715-5097

### **Radiology**

900 23rd St., N.W. Washington, D.C. 20037  
(202) 715-5183

### **Rehabilitation Services**

2131 K St., N.W. Washington, D.C. 20037  
(202) 715-5655

### **Social Work Services**

2150 Pennsylvania Ave., N.W., 3rd Floor  
Washington, D.C. 20037  
(202) 741-2218, (202) 994-2449

### **Surgery**

2150 Pennsylvania Ave., N.W., 6th Floor  
Washington, D.C. 20037  
(202) 741-3200

**The George Washington  
University Cancer Center**  
Science and Engineering Hall  
8th Floor  
800 22nd St., N.W.  
Washington, DC 20052  
202-994-0329  
[gwcancercenter.com](http://gwcancercenter.com)

**The George Washington  
University Hospital**  
900 23rd St., N.W.  
Washington, D.C. 20037  
(202) 715-4000  
[www.gwhospital.com](http://www.gwhospital.com)  
1-888-4GW-DOCS

**The George Washington  
University Medical  
Faculty Associates**  
2150 Pennsylvania Ave., N.W.  
Washington, D.C. 20037  
(202) 741-3000  
[www.gwdocs.com](http://www.gwdocs.com)

**The Dr. Cyrus and Myrtle  
Katzen Cancer Research Center**  
2150 Pennsylvania Ave., N.W.  
Suite 1-204  
Washington, D.C. 20037  
[www.katzencancer.org](http://www.katzencancer.org)

**The George Washington  
School of Medicine and  
Health Sciences**  
Ross Hall 2300 Eye St., N.W.  
Washington, D.C. 20037  
[smhs.gwu.edu](http://smhs.gwu.edu)



**Cancer Center**