

2016  
ANNUAL  
REPORT

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

THE GEORGE  
WASHINGTON  
UNIVERSITY  
HOSPITAL  
UHS

THE GEORGE WASHINGTON 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 GW CANCER CENTER DIRECTOR

As we enter into our third year since the establishment of the GW Cancer Center in July of 2015, allow me to share with you the significant academic growth we are experiencing, the innovative work we are conducting in basic sciences, clinical investigations, population sciences and cancer policy as well as our plans for physical expansion during the next academic year.

Upon my arrival to GW Cancer Center, I devoted several months to meet with faculty members across GWU campus and affiliated institutions that were working, or were interested, in cancer-related projects. A common theme that emerged from these interactions was the expertise already available at GWU in cancer biology (cell signaling in particular), viral and tumor immunology, neurosciences, biomedical engineering, bioinformatics, computational sciences and population sciences. This expertise together with the compassionate and state-of-the-art clinical care provided by our physicians and the national leadership in patient navigation and survivorship was clearly a “recipe” for success and provided our nascent Cancer Center with solid pillars to build upon and to profoundly transform cancer care in our region and beyond.

In parallel to identifying our strengths (and weaknesses), I also embarked in an aggressive recruitment of the senior leadership team for the Cancer Center. To date, I am thrilled to announce that this process is almost completed with the recruitment of all but one Associate Center Director. *Edward Seto, Ph.D.* a world-renown expert in cancer epigenetics and histone deacetylases (HDACs) is the Associate Center Director for Basic Sciences; *Michael Benedict, Pharm. D.*, brings to the GW Cancer Center two decades of experience in administration of NCI-designated cancer centers and is currently serving as the Associate Center Director for Administration and Finances. *Mandi Chapman*, a national leader in patient navigation, survivorship and health disparities was appointed Associate Center Director for Patient-centered initiatives and Health Equity. *Robert “Bob” Siegel*, who built the Division of Hematology/Oncology and has devoted his academic career to the training of GWU medical students, residents and fellows, was appointed Associate Center for Education, Training and Clinical Networking. More recently, we are fortunate to have attracted to GW Cancer Center a clinical investigator of the stature of *Mitchell R. Smith, MD, PhD*, who will serve as Associate Center Director of Clinical Investigations. Together with the Dean of the Milken Institute School of Public Health, we are getting close to recruit the Associate Center Director for Population Sciences and Cancer Policy and we hope to make the announcement in the next few months. We are also building a stronger relationship and scientific collaborations with Children’s National Medical Center and *Catherine Bollard, MD*, a world-renown cancer immunologist and expert in T-cell therapies has been appointed as co-leader of our Cancer Immunology and Immunotherapy Program and will help us in building a joint stem cell transplant and immune cell therapies between our two institutions.

But, our recruitment efforts had gone beyond senior leaders and to date we have recruited 16 additional faculty members (eight basic scientists and eight clinical investigators) that are now working with talented investigators that were already present at GWU before my arrival in 2015. Together, this unified team of almost 100 cancer center members, with both depth and breadth in cancer research, is highly committed to become leaders in cutting edge cancer research through innovative laboratory, translational, population sciences and clinical approaches with the overarching goal of obtaining National Cancer Institute (NCI)-designation within a decade.

To achieve this goal, we have made the strategic decision to invest in the following scientific programs: (1) Cancer Immunology & Immunotherapy, (2) Cancer Biology, (3) Microbial Oncology (4) Cancer Engineering and Technology, (5) Cancer Epidemiology and (6) Cancer Prevention, Control & Policy. These Programs are supported by shared resources: (a) Flow cytometry, (b) Cancer biorepository, (c) Imaging, and (d) OMICs/ Bioinformatics, with more to be established in the near future. In parallel to these efforts, the Cancer Center is making significant investments to build the clinical research infrastructure that will support and oversee all cancer-related clinical studies conducted at GWU. Central to the success of the clinical investigations program are the disease-oriented multidisciplinary teams (DOMT’s), which have been charged to bring together experts in a particular cancer type to deliver patient-centered care, and be the epicenter for novel clinical trials and emerging preventive and therapeutic modalities. Among the already functioning DOMTs are the Genitourinary (GU) Malignancies led by *Dr. J. Lin and H. Frazier*; the Lymphoma DOMT led by *Dr. K. Dunleavy*, a renowned lymphoma investigator recently recruited from NCI, the Breast Cancer DOMT, led by *Dr. R. Brem* and the Gynecologic Oncology DOMT led by *Drs. M. Lopez-Acevedo and W. Zhu*.

# A MESSAGE FROM THE GW CANCER CENTER DIRECTOR

To support our growth a proper space is needed and thanks to the unwavering commitment of the Senior Leaders of the School of Medicine and Health Sciences, the Medical Faculty Associates (MFA), the GW Hospital and the Milken Institute School of Public Health, we have been provided with state-of-the-art research and clinical facilities as briefly described below:

1. Research Facilities. GWU made a \$275 million investment to build a state-of-the-art 500,000 sq. ft. Science and Engineering Hall (SEH). The *eighth floor* of this facility host the administrative offices of the GW Cancer Center and the wet-lab space there support approximately fifteen labs focused on cancer research projects. In addition, a fully equipped animal facility is located on this floor, with a dedicated space for the hosting of patient-derived xenograft (PDX) animal models. To foster interactions with the clinical research enterprise, the Cancer Center made the decision to also host in this floor the Clinical Trials Office (CTO) where clinical investigators, clinical coordinators and data managers will be located. The *seventh floor* of SHE (Milken Institute School of Public Health) will host the Associate Center Director of Population Sciences and Policy and faculty recruits in the field of Cancer Epidemiology, Cancer Prevention, Control and Policy. Built to be an incubator of multidisciplinary collaboration, the SEH also fosters a powerful synergy between cancer researchers and experts from other disciplines (engineers, computational scientists, physicists, chemist, psychologist, anthropologists) that we believe would yield breakthrough innovations in cancer research.

2. Clinical Facilities. The MFA and the GW Hospital have recently undertaken an aggressive plan to provide the GW Cancer Center with new state-of-the-art clinical facilities. For outpatient care, the MFA has allocated significant space to be renovated soon, for diagnosis and treatment of cancer patients, including radiation oncology, medical oncology/hematology, surgical oncology consults and infusion services. The GW Hospital has also initiated renovations on the 4<sup>th</sup> floor of the Hospital to build state-of-the-art facilities for the Stem Cell Transplant/CAR T-cell Unit and for the Hematology/Oncology Inpatient Unit.

I cannot be more optimistic about the future of the GW Cancer Center. We are going to continue with our recruitment efforts and during our third year we expect to have onboard the leaders of our Stem cell transplant/CAR T-cells, neuro-oncology and gastrointestinal malignancies DOMTs. We will also continue to foster synergistic collaborations among Cancer Center members and with experts from different academic disciplines throughout campus. Finally, we will continue with the growth of our patient-centered clinical enterprise and we will develop a Strategic Plan for the next five years that would be fully aligned with our mission, *“to drive innovative cancer research, personalized patient care and cancer policy in the nation’s Capital”*

**Eduardor Sotomayor, MD**

Director, GW Cancer Center  
Professor of Medicine  
George Washington University  
School of Medicine and Health Sciences

## 2016 CHAIRMAN'S REPORT

The GW Cancer Program is a model partnership that unites the best clinical and research programs from the George Washington University (GW), the GW Hospital, the GW Cancer Center, the GW Medical Center, and the GW Medical Faculty Associates (MFA). We have continued to demonstrate our commitment to providing the best outcomes and quality of life for each of our cancer patients. I am proud of our growth over the past year, and look forward to exceeding our goals for the coming year as we continue to build a successful enterprise across the cancer care continuum.

In 2016, the number of faculty focused on cancer research and cancer treatment has grown significantly. We welcomed Dr. Farzana Walcott in Survivorship, Dr. Holly Dushkin in medical oncology, Dr. Ed Seto in basic sciences, Dr. Michael Whalen in Urology, and will welcome Dr. Faysal Haroun in medical oncology. Dr. Mitchell Smith has been appointed to expand GW's clinical research programs and Dr. Kieron Dunleavy has been appointed leader of the Lymphoma Section in the Division of Hematology and Oncology and co-leader of the Microbial Oncology Research Program at the GW Cancer Center. In combination with the Urologic Oncology team, Dr. Jianqing Lin is working closely with several Urologic oncologists to improve and expand our treatment of prostate cancer, kidney cancer and bladder cancer. Other new researchers include Dr. Catherine Bollard, from Children's National Medical Center who will study immunotherapy and Dr. Frank Glass who was recruited from Moffitt Medical Center to begin a cutaneous lymphoma section.

Other aspects of our cancer center includes survivorship, a key part of any modern cancer program, which is enrolling an increasing number of patients as they complete active treatment. Our Outreach program (including a new Mammovan) offers free screening for a variety of malignancies. All aspects of our clinical program will continue to grow, as more clinicians and clinical investigators are brought on board to treat an increasing variety of cancers.

We are looking forward to expanding our outpatient program to the ground floor in the Ambulatory Care Center, and the hospital will be supporting a new oncology unit and new home for our Bone Marrow Transplant Program. Additional staff are being hired to support these operations.

The GW Cancer Registry remains a vital part of the GW Cancer Program. The growth of the GW Cancer Registry has matched the increasing cancer caseload during last five years. The number of patients diagnosed and/or treated at the GW Hospital increased from 1,506 cases in 2012 to 2,289 cases in 2017.

We are making great progress toward applying for National Cancer Institute designation as a comprehensive cancer center. We are proud of our accomplishments and grateful for all who have contributed to our efforts along the way.

Sincerely,

**Robert Siegel, MD**

Professor of Medicine

Chairman, Cancer Committee



# DISCUSSION OF TREATMENT-RELATED INFERTILITY IN BREAST AND TESTICULAR CANCER PATIENTS

**By Dr. Lauren Mauro, MD**

Hematology & Oncology

The American Society of Reproductive Medicine, American Society of Clinical Oncology and the National Comprehensive Cancer Network guidelines all recommend that providers should discuss the possibility of treatment-related infertility for patients of child-bearing age prior to the initiation of chemotherapy. Options for fertility preservation should be discussed and referrals should be made to specialists when the patient expresses interest. As we were concerned that the GW Cancer Center was not meeting this recommendation for all appropriate patients, we examined new patients diagnosed with breast cancer or testicular cancer in calendar years 2013, 2014, and 2015. For the breast cancer patients, we specifically looked at those who were less than 45 years old and were given chemotherapy. For the testicular cancer patients, we looked at those who were less than 50 years old and included those who did and did not receive chemotherapy, as all underwent orchiectomy as part of their treatment. These two cancer subtypes were chosen as they are the largest group of patients at GW who should receive this counseling given their age and treatment paradigm

In 2013-2015, we had 79 new breast cancer patients who were < 45 years old of age and were recommended chemotherapy. Of the 79 cases, 25 patients did not receive chemotherapy here and therefore we do not have documentation whether the infertility risks were discussed with the patients. Of the 54 patients who did receive chemotherapy here, 1 was actively pregnant and therefore not a candidate for fertility preservation. Of the 53 other patients, 33 had documented discussions regarding the infertility risk with chemotherapy and were referred per patient preference. Many others did have infertility or premature menopause discussed as a possible side effect of chemotherapy, however their desire for fertility preservation was not documented. Of those, many were greater than age 40 and/or already had children. It is unknown whether more conversations occurred between the patient and the physician yet were undocumented. It is considered the responsibility of the medical oncologist to discuss the infertility side effects of the chemotherapy as opposed to the surgeon or radiate oncologist. Therefore 62% of the qualified patients who received chemotherapy here at GW had documented discussions regarding the risk of infertility and their interest in preserving their fertility, lower than the recommended goals.

When looking at testicular cancer diagnoses in the years 2013 through 2015, we had 35 new diagnoses in men less than age 50. 1 chart was unable to be accessed because of medical record issues. 5 of these patients did have their surgeries and thus pathology reports here at GW Hospital, however there are no available urology or medical oncology notes, meaning that those providers were not part of the GW MFA. Of the 29 patients who received their urology and/or medical oncology care here, 20 patients (accounting for 68% of qualified patients) had documented discussions of infertility and referrals made to specialists per patient preference. There was no clear documentation of a discussion in the other 9 cases. As noted above, it is unknown whether the other patients had discussions with their physicians that were undocumented.

Therefore we concluded that although the majority of patients who are child bearing age are receiving appropriate fertility counseling, we are not at our goal of having an onco-fertility discussion with all appropriate patients. We took this data to create a quality improvement project as detailed below.

# THE KATZEN CANCER RESEARCH CENTER 2016

## Leo Schargorodski

Executive Director

Celebrating our seventh year, the Katzen Cancer Research Center launched a number of new programs in 2016, expanded our most successful projects and continued our efforts to attract outstanding scientists to contribute to the GW cancer research efforts. Utilizing our state-of-the-art clinical facilities, funded by the donation from Dr. Cyrus and Mildred Katzen in 2008, the Center has expanded its research efforts by support staff dedicated to enhancing patient care by developing a comforting environment to facilitate the delivery of care to our patients and to include the ability to participate in new life-saving clinical trials.

The Katzen Center has enabled GW to offer new therapies to more patients, expand the physician and nursing teams to attend to the vast needs of their patients and offer patients a relaxing, healing atmosphere as they receive what can be exhausting treatment. For medical students, our facilities have provided them with more opportunities to learn about personalized cancer medicine and targeted therapies and get hands-on experience learning about cutting-edge modalities for treating the various types of cancers.

### Treating the Whole Patient and the Family

The 2001 Institute of Medicine (IOM) report *Cancer Care for the Whole Patient: Meeting Psychosocial Health Needs*, states that health problems, limited finances and inadequate social support are associated with increased morbidity and mortality, and decreased functional status.

As part of providing comprehensive cancer care, the Katzen Center hosts many holistic and wellness support groups, funded by the PAF. These groups are open to all cancer patients in the DC metropolitan area and currently we serve more than 500 patients annually. Our support groups include:

- Active Treatment Support Group
- Caregiver Support Group
- Kids' Club - for children and grandchildren of patients (during the school year)
- Brain Tumor Support Group
- Post-Treatment Breast Cancer Education Group
- Prostate Cancer Support Group - for men, their families and significant others

- Washington D.C. Metropolitan Area Brain Tumor Support Group
- Multiple Myeloma Support Group for Patients and Family Members
- DC Young Adult Cancer Community
- Restorative Yoga

These groups have grown to provide increased care and coping skills that improve our patients' quality of life. These groups are free, not only to patients of the Katzen center, but to all patients in the DC Metro area. The PAF pays for literature for the groups, provides parking vouchers and sometimes snacks or a meal.

A Katzen Cancer Research Center Support Group patient recently wrote,

*"The new you...*

*Is Not the patient...*

*It is you who started doing yoga...*

*You who attended meetings*

*that light your way to better health...*

*You who have been offered new venues to share and exchange...*

*You who have more love and compassion and can laugh louder...*

*The new you."*

Another patient wrote *"The myeloma program is enormously valuable for me by providing information about the disease and the emotional reassurance that I am not alone in the myeloma category. The stories of other patients are inspiring and show me the way forward in my own battle. At the same time, our myeloma group receives medical info from physicians and scientists who educate us about developments in the fast-changing world of MM treatment."*

One of the newest Support Groups is the Gentle Yoga class. This class meets every Tuesday from 4 - 5 pm and is led by certified Yoga instructors. Two patients recently commented on their experience,

*"Whenever I can attend the class, I feel better afterwards. This gentle yoga class helps alleviating temporarily my body aches and pain. Please continue this class."*

*"The yoga group is a staple of my treatment plan. The classes are fun, helpful and help me connect with others. Yael (one of the instructors) is always funny, never pushy and runs the group based on our needs of the day."*

# THE KATZEN CANCER RESEARCH CENTER 2016

Parents of children participating in our Kids Club tell us how important this program is to them and their children. For some children, it often feels like they are the only family who has a parent dealing with cancer. This program helps children normalize the cancer experience by working with other children in a similar situation and through the ability to express their feelings through art therapy.

Starting in 2015 we have been offering an "Introduction to Chemotherapy" class for all new patients. This is a comprehensive class where patients and their caregivers get to meet various key staff people (Nurse, Social Work, Patient Navigator, Financial Counselor, Office Manager), as well as learn about pertinent topics such as symptom management, fatigue, fertility, logistics of treatment and support services. This has been a great addition to our programming, and we have received a great deal of positive feedback regarding how helpful the class is.

We are now offering free massage, three times a week, to patients who are receiving infusions. We teamed up with specially trained oncology massage therapist who come into our clinic and give shoulder, head, hand and foot massage to patients as they are receiving treatment. One patient said, *"I was lucky enough to get to meet Lucille, and get a lovely massage during my treatment yesterday. This is a wonderful service, and I really appreciated the gentle and relaxing massage (I went with neck and shoulders). It was a very nice treat, and helped me pass the time in infusion."*

We are hoping to be able to expand the integrative services we offer while patients are receiving infusion. We have received a number of requests for Reiki as well as art therapy.

## **The Patient Assistance Program Continues to Grow**

The Patient Assistance Fund continues to grow, in large part through the generous donations of the Katzen Center's patients.

In 2016 the Katzen Center added a monthly support group meeting for Cancer survivors. With improvements in diagnosis and treatment, more people are surviving cancer. It is estimated that there are approximately 14 million cancer survivors as of January 2014 and there will be close to 19 million by 2024. Our healthcare system is not prepared to handle the needs of these patients over the next 10 years, so new models of care are being piloted and studied.

The Cancer Survivors Support Group, collaboration between the Oncology and the Primary Care Departments at MFA, has many potential benefits—combining expert knowledge of the disease and treatment with expert knowledge of the patient. The Support Group, has three goals:

- Improve the lives of cancer survivors by addressing symptoms and focusing on screening and proper follow up to reduce and manage possible long term toxicities of cancer treatment.
- Conduct and participate in clinical trials focused on this population.
- Educate patients, doctors, nurses and other healthcare providers on the long term needs of cancer survivors.

There are on average 120 new cases of cancer diagnosed each month, or over 1400 new cases diagnosed a year at the George Washington University Hospital. The Katzen Center hopes to meet and provide care to each and every cancer survivor.

Additionally the Social Services staff was increased by three important positions. The Katzen Center added a Patient Navigator, an Oncology Dietician and a Financial Resources Manager. These positions greatly enhance the ability to identify and assist patients throughout the year.

## **Establishment of the Albert L. and Elizabeth T. Tucker Foundation Research Fellowship Award**

In 2015, through a generous contribution of \$1 million from the Albert L. and Elizabeth T. Tucker Foundation, an Oncology Postdoctoral Research Fellowship was established at the Katzen Center. As a part of the GW Cancer Center, The Katzen Cancer Research Center will continue and expand this educational program for postdoctoral scientists who propose to work on highly innovative research projects that challenge the traditional paradigms of understanding the causes, mechanisms, progression, disease markers or risk factors of the most difficult-to-treat cancers, including multiple-myeloma, pancreatic, lung, liver, sarcomas, esophageal, brain, gastric, bone and ovarian cancers, along with rare leukemias, lymphomas and MDS.

The program will integrate the highest quality of basic science laboratory studies with a fundamental understanding of the unique requirements of clinical translation of the discoveries. It is designed to train postdoctoral fellows in the development and testing of clinically important diagnostic and therapeutic



# THE KATZEN CANCER RESEARCH CENTER 2016

strategies. As the first priority, fellows are trained in highly critical and successful laboratories of cancer researchers at the GW campus to assure the highest level of scientific rigor. In addition, seminar discussion series will be designed to focus on the unique requirements for clinical translation of the basic science findings. Postdoctoral fellows will be expected to take part in both clinically relevant courses and participate in the seminar discussion series.

Research leading to breakthroughs in these types of cancers and increased life expectancy are at the core of the Cancer Center's mission.

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

The Mid-Atlantic Hematology Consortium is 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, DC) 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 Consortium provides 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 Consortia 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.

## **Awarding of \$450,000 in grants for innovative pilot cancer research**

The Katzen Cancer Research Center selected two of the most promising research studies for the Innovative Cancer Research Pilot Grant Program. In its sixth year, the program awarded \$150,000 for research projects. The grants were:

*Role of a Novel Mitochondrial Gene in Triple Negative Breast Cancer Phenotype (Clinical/Translational) Submitted by Goberdhan Dimri, PhD and Arnold Schwartz, MD*

This proposal will test a novel concept that a mitochondrial gene which is encoded inside another mitochondrial gene is the key player in the development of triple negative breast cancer.

*Integrating 3D Bioprinting and nanotechnology for Improved Metastatic Cancer Analysis and Treatment (Continuation) Submitted by Robert Siegel, MD, Lijie Grace Zhang, PhD*

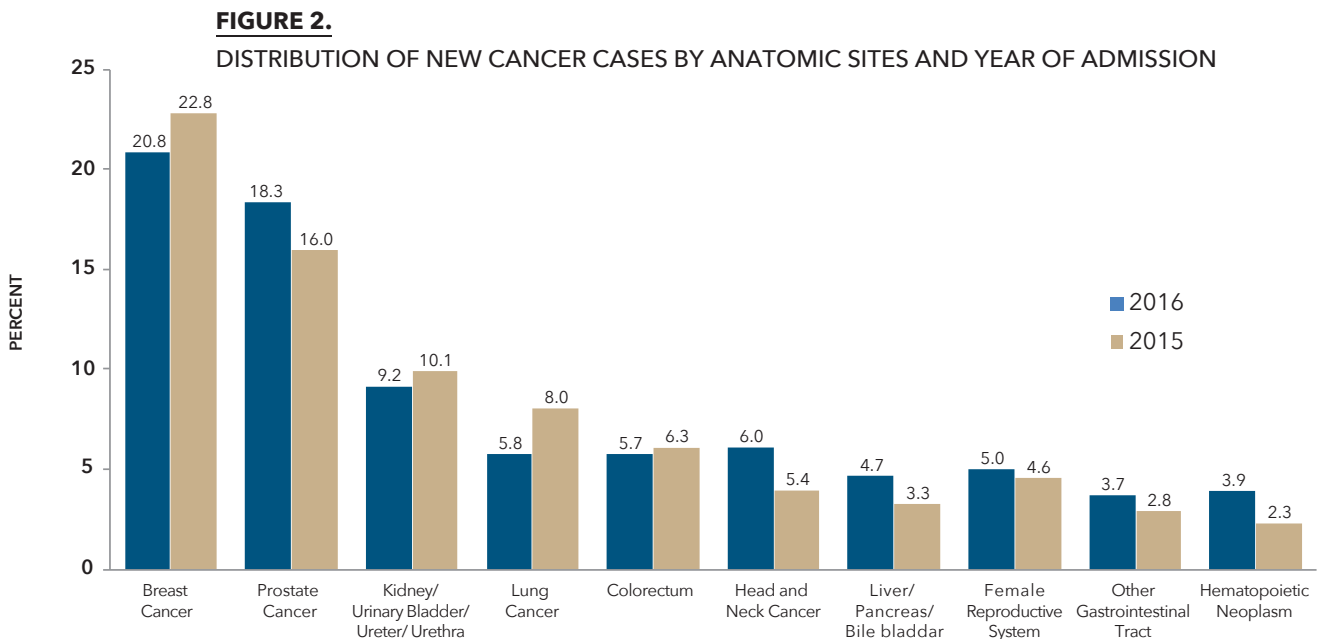
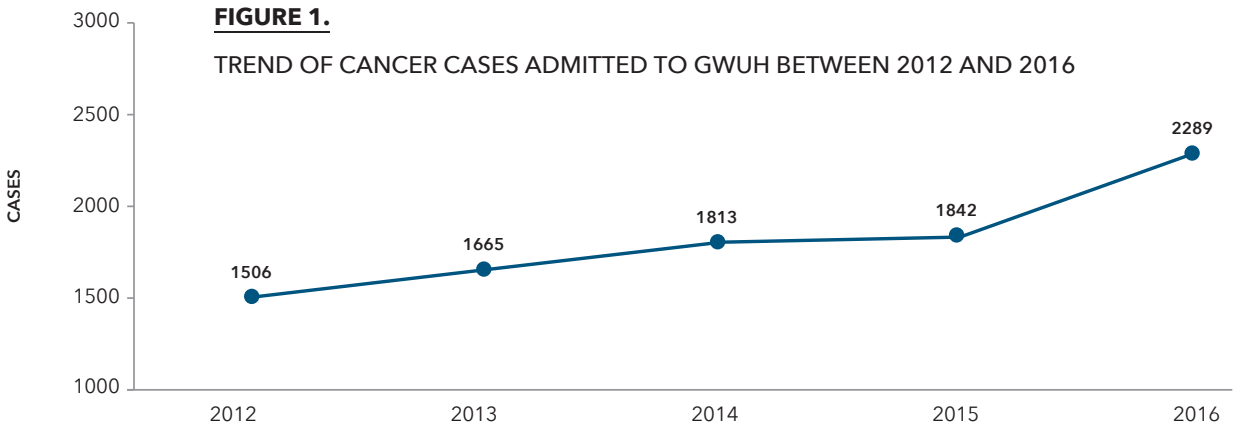
The biomimetic 3D printed nano bone model developed in this project can facilitate new breast cancer gene treatment discovery. Furthermore, it can provide a highly innovative approach for more efficient in vitro analysis of breast cancer bone metastasis and resultant osteotropism in response to biomimetic bone microenvironments in the future.

# 2016 GWUH CANCER REGISTRY

## CANCER DATA REPORT

The GW cancer registry has been growing consistently for the past five years between 2012 and 2016. The number of patients admitted to GWUH increased from 1,506 cases in 2012 to 2,289 cases in 2016 (**Figure 1**). The number of patients admitted GWUH were 2,289 cases in 2016. Of these admitted patients in 2016, 1,473 cases (64%) 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 GWUH. There was a significant increase in prostate cancer cases in 2016 compared to 2015 respectively (18.3 vs. 16.0), hematopoietic neoplasm (3.9 vs. 2.3); accessory gastrointestinal organs like liver and pancreas (4.7 vs. 3.3), and gastrointestinal tract organs (3.7 vs. 2.8). There was a slight increase in head/neck (6.0 vs. 5.4) and female reproductive system organs (5.0 vs. 4.6)



# TABLE 1: THE GEORGE WASHINGTON UNIVERSITY HOSPITAL (GWUH)

## 2016 CANCER CASES BY ANATOMIC SITES

Primary site	All Cases		Analytic Cases		Race*** (Analytic Cases Only)			AJCC Stage at Diagnosis (Analytic Cases Only)						
	#	%	#	%	W	B	O	0	I	II	III	IV	88	UNK
<b>Head and Neck</b>	<b>106</b>	<b>4.6</b>	<b>89</b>	<b>6.0</b>	<b>53</b>	<b>28</b>	<b>8</b>	<b>2</b>	<b>16</b>	<b>17</b>	<b>16</b>	<b>26</b>	<b>7</b>	<b>5</b>
Lips and other	4	.2	3	.2	1	2	0	0	0	0	1	0	1	1
Tongue	26	1.1	17	1.2	14	1	2	0	2	5	1	7	0	2
Salivary Gland	10	.4	9	.6	4	3	2	0	3	3	1	1	1	0
Floor of Mouth	6	.3	6	.4	3	1	2	0	0	2	1	3	0	0
Gum and Palate	8	.4	8	.5	5	1	2	0	4	2	0	0	2	0
Tonsil	15	.7	12	.8	12	0	0	0	1	1	2	8	0	0
Nasopharynx	3	.1	2	.1	0	2	0	0	0	0	1	1	0	0
Oropharynx	7	.3	6	.4	3	3	0	0	0	2	2	2	0	0
Hypopharynx	1	0	1	.05	1	0	0	0	0	0	0	0	0	1
Nose/Nasal cavity	3	.1	3	.2	3	0	0	0	0	0	1	1	0	1
Sinus	1	0	1	.05	0	1	0	0	0	0	0	0	1	0
Larynx	22	1.0	21	1.4	7	14	0	2	6	2	6	3	2	0
<b>Digestive System</b>	<b>256</b>	<b>11.2</b>	<b>208</b>	<b>14.1</b>	<b>81</b>	<b>103</b>	<b>24</b>	<b>6</b>	<b>52</b>	<b>35</b>	<b>34</b>	<b>39</b>	<b>5</b>	<b>37</b>
Esophagus	6	.3	6	.4	2	4	0	0	1	1	3	1	0	0
Stomach	34	1.5	28	1.9	8	14	6	0	9	5	3	5	1	5
Small intestine	21	1.0	20	1.4	5	13	2	0	4	5	7	0	0	4
Colon	58	2.5	43	2.9	17	21	5	1	16	4	7	9	0	6
Rectosigmoid Junction	9	.4	8	.5	3	3	2	1	2	1	1	1	0	2
Rectum	28	1.2	23	1.6	11	7	5	2	3	4	5	3	0	6
Anus/Anal canal	15	.7	10	.7	6	3	1	2	2	1	3	0	0	2
Liver/Intrahepatic duct	25	1.1	19	1.3	6	11	2	0	4	1	3	5	2	4
Gallbladder	6	.3	6	.4	4	2	0	0	3	2	0	0	0	1
Extrahepatic Duct	2	0	2	.1	1	1	0	0	0	0	0	0	1	1
Pancreas	49	2.1	42	2.9	18	23	1	0	8	11	2	15	0	6
Other digestive organs	3	.1	1	0	0	1	0	0	0	0	0	0	1	0
<b>Respiratory System</b>	<b>116</b>	<b>5.0</b>	<b>88</b>	<b>6.0</b>	<b>42</b>	<b>43</b>	<b>3</b>	<b>0</b>	<b>32</b>	<b>5</b>	<b>8</b>	<b>34</b>	<b>3</b>	<b>6</b>
Trachea/Main bronchus	2	0	2	.1	0	1	1	0	0	0	0	1	1	0
Lung	109	4.8	83	5.7	40	42	1	0	32	5	8	33	0	5
Thymus/Mediastinum	5	.2	3	.2	2	0	1	0	0	0	0	0	2	1
<b>Bones</b>	<b>6</b>	<b>.3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>
<b>Soft Tissue</b>	<b>20</b>	<b>.9</b>	<b>10</b>	<b>.7</b>	<b>4</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>1</b>
Peritoneum	6	.3	3	.2	3	0	0	0	0	1	0	0	1	1
Connective tissues	14	.6	7	.5	1	6	0	0	2	2	0	1	2	0
<b>Breast</b>	<b>379</b>	<b>16.6</b>	<b>307</b>	<b>20.8</b>	<b>137</b>	<b>147</b>	<b>23</b>	<b>77</b>	<b>120</b>	<b>79</b>	<b>20</b>	<b>10</b>	<b>0</b>	<b>1</b>
<b>Female Genital</b>	<b>123</b>	<b>5.4</b>	<b>74</b>	<b>5.0</b>	<b>15</b>	<b>50</b>	<b>9</b>	<b>0</b>	<b>31</b>	<b>2</b>	<b>17</b>	<b>16</b>	<b>2</b>	<b>6</b>
Vulva	6	.3	3	.2	1	2	0	0	2	1	0	0	0	0
Cervix Uteri	51	2.2	17	1.2	4	8	5	0	6	1	5	4	0	1
Corpus Uteri	42	1.8	36	2.4	5	27	4	0	21	0	7	6	0	2
Ovary	18	.8	15	1.0	5	10	0	0	2	0	5	5	0	3
Female Genitalia	6	.3	3	.2	0	3	0	0	0	0	0	1	2	0

# TABLE 1: THE GEORGE WASHINGTON UNIVERSITY HOSPITAL (GWUH)

## 2016 CANCER CASES BY ANATOMIC SITES

Primary site	All Cases		Analytic Cases		Race*** (Analytic Cases Only)			AJCC Stage at Diagnosis (Analytic Cases Only)						
	#	%	#	%	W	B	O	0	I	II	III	IV	88	UNK
<b>Prostate</b>	<b>390</b>	<b>17.0</b>	<b>270</b>	<b>18.4</b>	<b>136</b>	<b>118</b>	<b>16</b>	<b>0</b>	<b>45</b>	<b>164</b>	<b>43</b>	<b>18</b>	<b>0</b>	<b>0</b>
<b>Male Genital</b>	<b>29</b>	<b>1.2</b>	<b>25</b>	<b>1.7</b>	<b>22</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>10</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>6</b>
Other male organs	3	.1	3	.2	2	0	1	1	1	0	1	0	0	0
Testis	26	1.1	22	1.5	20	1	1	0	9	4	3	0	0	6
<b>Urinary System</b>	<b>181</b>	<b>7.9</b>	<b>135</b>	<b>9.2</b>	<b>69</b>	<b>60</b>	<b>6</b>	<b>19</b>	<b>67</b>	<b>13</b>	<b>15</b>	<b>15</b>	<b>0</b>	<b>6</b>
Kidney	98	4.3	82	5.6	40	37	5	0	50	7	11	11	0	3
Renal Pelvis/ Ureter	17	.7	12	.8	7	4	1	5	3	0	2	1	0	1
Urinary bladder	65	2.9	40	2.7	21	19	0	14	14	6	2	3	0	1
Urethra	1	0	1	.1	1	0	0	0	0	0	0	0	0	1
<b>Brain / CNS</b>	<b>69</b>	<b>3.0</b>	<b>51</b>	<b>3.5</b>	<b>29</b>	<b>14</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>51</b>	<b>0</b>
Meninges	25	1.1	19	1.3	6	10	3	0	0	0	0	0	19	0
CNS/Brain/Spinal Cord	35	1.5	28	1.9	20	4	4	0	0	0	0	0	28	0
PNS	9	.4	4	.3	3	0	1	0	0	0	0	0	4	0
<b>Endocrine System</b>	<b>106</b>	<b>4.6</b>	<b>83</b>	<b>5.6</b>	<b>37</b>	<b>34</b>	<b>12</b>	<b>0</b>	<b>44</b>	<b>10</b>	<b>12</b>	<b>1</b>	<b>15</b>	<b>1</b>
Thyroid	80	3.5	68	4.6	32	24	12	0	11	10	12	1	0	1
Other endocrine glands	26	1.1	15	1.0	5	10	0	0	0	0	0	0	15	0
<b>Lymphoma</b>	<b>36</b>	<b>1.6</b>	<b>27</b>	<b>1.8</b>	<b>15</b>	<b>9</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>5</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>8</b>
Hodgkin's	5	.2	4	.3	2	2	0	0	0	1	0	2	0	1
Non Hodgkin's	31	1.4	23	1.5	13	7	3	5	1	4	6	0	0	7
<b>Blood</b>	<b>83</b>	<b>3.6</b>	<b>53</b>	<b>3.6</b>	<b>23</b>	<b>27</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>53</b>	<b>0</b>
Multiple myeloma	41	1.8	23	1.6	11	12	0	0	0	0	0	0	23	0
Chronic leukemia	7	.3	5	.3	3	2	0	0	0	0	0	0	5	0
Acute leukemia	13	.6	12	.8	4	6	2	0	0	0	0	0	12	0
Other blood disorders	22	0.9	13	.9	5	7	1	0	0	0	0	0	13	0
<b>Skin</b>	<b>356</b>	<b>15.6</b>	<b>28</b>	<b>1.9</b>	<b>20</b>	<b>4</b>	<b>4</b>	<b>7</b>	<b>10</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>
Melanoma	37	1.6	24	1.6	19	1	4	7	9	1	2	3	0	2
Other carcinoma	319	14.0	4	.3	1	3	0	0	1	1	0	0	1	1
<b>Unknown</b>	<b>33</b>	<b>1.4</b>	<b>24</b>	<b>1.6</b>	<b>12</b>	<b>9</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>0</b>
<b>GRAND TOTAL</b>	<b>2289</b>	<b>100.0</b>	<b>1473</b>	<b>100.0</b>	<b>695</b>	<b>654</b>	<b>124</b>	<b>117</b>	<b>430</b>	<b>339</b>	<b>177</b>	<b>165</b>	<b>165</b>	<b>80</b>

**NOTE:** \* Analytic – diagnosed only (class 0) or initially diagnosed at GWUH and all or part of first course of therapy at GWUH(class 1) or case diagnosed elsewhere and all or part of first course of therapy at GWUH (class 3) \*\* Non-analytic case – initially diagnosed and treated elsewhere, referred to GWUH 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.

# REVIEW LYMPHEDEMA REFERRALS IN 2016 TO COMPARE WITH 2013-2015

**Sana Tabbara, MD**

Director, Anatomic Pathology

	# CASES REVIEWED	CASES HAD AXILLARY LYMPH NODE DISSECTION	LYMPHEDEMA REFERRALS FOR CASES WITH AXILLARY LYMPH NODE DISSECTION	MORE THAN 6 SENTINEL NODES CASES	LYMPHEDEMA REFERRALS FOR >6 SENTINEL NODE CASES
<b>2013</b>	68	46 (68%)	17/46=37%	10	6/10=60%
<b>2014</b>	67	44 (66%)	19/44=43%	10	1/10=10%
<b>2015</b>	42	24 (57%)	18/24=75%	6	1/6=17%
<b>2016</b>	63	39 (61%)	35/39=90%	8	6/8=75%

The risk of lymphedema in patients with axillary lymph node dissection is significant. We evaluated the referral pattern of patients with breast carcinoma who underwent breast surgery and axillary lymph node dissection for consultation for lymphedema therapy.

Prior to 2015, the multidisciplinary team did not include an on-site lymphedema therapist. In 2015 GW hired their own lymphedema therapists affiliated with the STAR program. The therapists met with the oncologists and provided education on lymphedema. As a result of this intervention, the number of referrals increased substantially to 90% in 2016.

During that same time period, the referral pattern for consultation for lymphedema therapy of patients who underwent breast surgery and sentinel lymph node biopsy with more than 6 lymph nodes removed also showed a significant increase in numbers to 75% in 2016.

This study demonstrates a significant improvement in patient referral pattern to lymphedema therapy and the success of the intervention.



## RESOURCES AND SUPPORT

# THE GEORGE WASHINGTON UNIVERSITY AND GW CANCER INSTITUTE 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

### **The George Washington Cancer Institute**

2030 M St., N.W., 4th Floor  
Washington, D.C. 20036  
(202) 994-2449  
www.gwcancerinstitute.org

### **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 Education and Outreach**

2030 M St., N.W., Suite 4003  
Washington, D.C. 20036  
(202) 994-2449

### **Cancer Prevention and Control**

2030 M St., N.W., Suite 4003  
Washington, D.C. 20036  
(202) 994-2449

### **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  
Cancer Center**  
Science and Engineering Hall  
8th Floor  
800 22nd St., N.W.  
Washington, DC 20052  
202-994-0329  
<https://cancercenter.gwu.edu/>

**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  
<https://smhs.gwu.edu/>



**Cancer Center**