



# GW RADIATION ONCOLOGY

Annual Update 2019

Radiation Oncology GW Medical Faculty Associates 2150 Pennsylvania Ave NW, DC Level Washington, DC 20037 gwcancercenter.com bit.ly/GWRadOnc t (202) 715-5097 f (202) 715-5136

## Sharad GOYAL MD

### A LETTER FROM THE DIVISION DIRECTOR

I am delighted to share our 2019 annual newsletter with you. I hope you will enjoy reading the selected highlights in the pages that follow; they represent just a portion of the broad array of activities of GW Radiation Oncology. One of the themes running through several stories is "interprofessional collaboration."

While much of that collaboration occurs naturally in the team work of our physicians, physicists, nurses and radiation therapists within Radiation Oncology, important collaborations with our colleagues in the GW Cancer Center, Department of Surgery, Department of Neurosurgery, Department of Urology and others are also described in the pages that follow. For example, over the past year, we have launched new clinical programs like stereotactic prostate radiation therapy and GYN brachytherapy. We have plans to launch other clinical programs, like total body irradiation, soon and will continue to roll out new technologies.

In addition to highlighting an outstanding collection of new research projects, abstracts and publications, we have grown our medical student rotation and remain committed to educating the next generation of leaders in the field. We are also pleased to have hosted our first ever Mid-Atlantic Radiation Oncology Symposium in March 2019, furthering the momentum of GW Radiation Oncology.

The fruits of collaboration depend on the support and partnership from colleagues and collaborators like you. We are forever grateful for your interest and for your support. I welcome your feedback and invite you to stay connected as we strive to advance our work and enhance the impact of GW Radiation Oncology.

Sharad Goyal, MD

### GW Radiation Oncology Annual Update 2019

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### Meet our PROVIDERS



Sharad Goyal, MD Professor Division Director Specialties: Breast, CNS



Martin Ojong Ntui, MD Assistant Professor

**Specialties:** Breast, CNS, Lung, Gl **Specialties:** Breast, GU, GI, Palliative



**Yuan James Rao, MD** Assistant Professor Director of Brachytherapy

**Specialties:** GU, GYN, H&N



**Diana Scully, FNP** 

**Specialties:** Women's Health

### FACULTY AND STAFF LISTING

#### Faculty

Sharad Goyal, MD (Division Director) Martin Ojong-Ntui, MD Yuan James Rao, MD

**Manager** Rana Kianni, RTT

**Medical Physics** Mehrdad Sarfaraz, PhD (Chief) Gizem Cifter, PhD Hamid Aghdam, MS

**Nursing** Diana Scully, FNP Shacoya Arthur, RN Shamel Boston, CNA

#### **Radiation Therapists**

Emebet Sileshi, RTT Sirak Woldetsadik, RTT Steven Salama, RTT Janette Blanco, RTT Joseph Phelan, RTT Carly Dugan, RTT

**Reception/Front Desk** April Baptiste Judith Thompson

Administrative Jenna Breitstein (PGA) Kristina Williams Keyana Foster



### **RECENT PUBLICATIONS**

- Kubendran S, Rao YJ, Dor A, Ojong M, Goyal S. The relationship between industry payments on research productivity and career success of academic radiation oncologists. Submitted to *Int J Radiat Oncol Biol Phys*.
- 2. Miller RC, Deville C, Goyal S, et al. Thank you to those who peer reviewed in 2018 for Advances in Radiation Oncology. *Adv Radiat Oncol.* 2019 Apr 16;4(2):211-217.
- Sundararajan S, Kaufman H, Giglio M, Ranganathan S, Gendal V, Goyal S, Roychowdhury S. Monitoring triggered electromyography and motor evoked potentials during cryoablation of osseous metastatic disease: A case report. *Journal of Oncology*. 2019; Article ID 5247837,1-6.
- Gupta A, Khan AJ, Goyal S, et al. Insurance approval for proton beam therapy and its impact on delays in treatment. *Int J Radiat Oncol Biol Phys.* 2018 Dec 1; pii: S0360-3016(18)34187-7.
- Meleis A, Jhawar SR, Goyal S. Stereotactic body radiation therapy in non-surgical patients with metastatic spinal disease with epidural compression: A retrospective review. World Neurosurgery. 2019 Feb;122:e198-e205.
- Farber NJ, Rivera-Nunez Z, Kim S, Shinder,...Goyal S., et al. Trends and outcomes of lymphadenectomy for nonmetastatic renal cell carcinoma: A propensity score-weighted analysis of the National Cancer Database. *Urol Oncol.* 2019 Jan;37(1):26-32.
- Arlow RL, Niu X, Haffty BG, Goyal S, et al. Breast conservation therapy after neoadjuvant chemotherapy does not compromise 10-year breast cancer specific mortality. *Am J Clin Oncol.* 2018 Dec;41(12):1246-1251.

### Research ROUNDUP



### American Society of Radiation Oncology Annual Meeting

- Patterns of Care and Survival Outcomes be tween Patients with Unresected Hepatocellular Carcinoma Treated with External Beam Vs Radioembolization in the SEER Database. Bhargava Chitti, Daniel Scher, Albert Chun, Shawn Sarin, Sharad Goyal, James Rao. Poster Viewing Q&A Session
- Association of Radiation Dose Fractionation and Immunotherapy Use with Overall Survival in Metastatic Melanoma Patients. Shang Jui Wang, Sachin Jhawar, Zorimar Rivera Nunez, John Byun, Rahul Parikh, Joseph Weiner, Sharad Goyal. Oral Scientific Session
- Tumor Heterogeneity and Genomics to Predict Radiation Therapy Outcome for Head and Neck Cancer: A Machine Learning Approach. Apurva Singh, Sharad Goyal, James Rao, Murray Loew. *Oral Scientific Session*

### GW Research Days

• The Relationship between Industry Payments on Research Productivity and Career Success of Academic Radiation Oncologists. Sindhu Kubendran, James Rao, Avi Dor, Martin Ojong, Sharad Goyal. *Poster Viewing Q&A Session* 

### Mid Atlantic Chapter and Annual Meeting of the American Association of Physicists in Medicine

- Comparison of Conventional 3D CRT and IMRT for Craniospinal Irradiation. Gizem Cifter, Sharad Goyal, Hamid G Agdam, Mehrdad Sarfaraz. *Scientific Session Title: Oral*
- Lin AJ, Gang M, Rao YJ, et al. Association of post-treatment lymphopenia and elevated neutrophil-to-Lymphocyte ratio with poor clinical outcomes in patients with human papillomavirus-negative oropharyngeal cancers. JAMA Otolaryngol Head Neck Surg. 2019 Mar 28.
- 9. Lin AJ, Rao YJ, et al. Post-operative radiation effects on lymphopenia, neutrophil to lymphocyte ratio, and clinical outcomes in palatine tonsil cancers. *Oral Oncol.* 2018 Nov;86:1-7.
- 10. Gizem Cifter. Nanoparticle aided radiotherapy during accelerated partial breast irradiation. Advancements in nanotechnology and nanoparticle-aided radiotherapy. 2019. Eds: Wilfred Ngwa.



### MID-ATLANTIC RADIATION ONCOLOGY CONSORTIUM DRAWS OVER 70 ATTENDEES

Dr. Sharad Goyal hosted the first Mid-Atlantic Radiation Oncology Consortium on March 20, 2019 at the Ritz Carlton in Georgetown. The dinner meeting was developed to inform radiation oncologists, medical physicists, dosimetrists, residents and students in the metropolitan Washington, D.C. area (Maryland, Virginia and Washington, DC) of the most recent advances in radiation oncology research and its application to treatment. Speakers included Dr. Gopal Bajaj, Chair of INOVA Radiation Oncology and Dr. Akila Viswanathan, Interim Chair of Johns Hopkins Radiation Oncology.

We were pleased to welcome over 70 guests to the event and particularly gratified by strong attendance at the first meeting. The Mid-Atlantic Radiation Oncology Consortium was designed to foster collaboration, promote the exchange of ideas and facilitate networking among radiation oncologists, medical physicists, dosimetrists and trainees. As the only regional symposium for radiation oncology in the Washington, D.C. metro area, this event is scheduled to be held twice a year.

We are grateful to the GW Cancer Center for their support of this important event as well as to Dr. Robert Siegel and Leo Schargorodski for their leadership in planning the event.





### A Little Bit of Space Makes a Big Difference

Dr. James Rao (Radiation Oncology) has begun administering SpaceOAR hydrogel in patients undergoing prostate radiotherapy in conjunction with Dr. Michael Whalen (Urology).

SpaceOAR hydrogel is injected into place prior to the start of radiation treatment. Patients may be awake or asleep under general anesthesia for the procedure. It is minimally invasive and is gradually absorbed by the body.

The rectum's proximity to the prostate makes it susceptible to injury during high radiation doses. According to SpaceOAR manufacturer Augmentix, Inc., to reduce this injury, the spacer pushes the rectum away from the prostate, adding about 1cm (1/2 inch) of extra space between the prostate and the rectum.

This distance significantly reduces the radiation dose to the rectum and patients who received the hydrogel reported significantly less rectal pain during radiotherapy and had significantly less severe long term rectal complications.

Results from a <u>randomized clinical trial</u> show fewer declines in bowel quality of life, urinary quality of life and sexual function in patients using SpaceOAR hydrogel.







### **Chart Rounds Transition**

In August 2018, we transitioned from a weekly retrospective peer review program ("chart rounds") to a prospective daily contouring and planning rounds. When possible, for each patient, we review the physician delineated volumes, anticipated dose/fractionation, and normal tissue dose constraints during treatment planning or prior to the start of treatment. Our goal in making this transition is to maximize the impact of peer review, and to maximize the educational opportunities for all staff. We have had positive feedback from our physicians, physicists, and support staff so far and hope to refine our process as we move forward.

### New Treatment Planning System

In summer of 2019, we expect to begin implementation of the RayStation treatment planning system at GW Hospital and will enter clinical use in late 2019. RayStation offers a full array of radiotherapy treatment planning tools for linac-based radiotherapy treatments. In addition to standard planning tools, RayStation has additional tools like automated planning and multi-criteria optimization to improve efficiency and plan quality. RayStation is also designed to make adaptive planning much more efficient, allowing us to extend adaptive radiotherapy to a larger number of patients. RayStation will be used to perform treatment planning for a wide variety of treatment sites.

### Electronic Medical Record System to be Upgraded

In fall of 2019, we expect a complete software upgrade of our electronic medical record system, ARIA v15. As a result of the upgrade, there will be improved encrypted communications to help protect patient data from malicious attacks, and secure logins with your existing clinical environment credentials to ensure up-to-date authentication. Our hope is that the added data protection and improved user experience helps fight against data breaches so we can focus on providing seamless, simplified, and secure patient care.



### PATIENT-DERIVED XENOGRAFT (PDX) MODELS FOR ONCOLOGY DRUG DISCOVERY

Human cancer xenografts in mice can provide predictive data on the success of candidate drugs in clinical trials and have been a pivotal tool in moving new drugs from the bench to the clinic. However, currently available immunodeficient mouse models have shown some limitation and variability in tumor take rates and growth kinetics.

Patient Derived Xenografts (PDX), in which tumor tissue is transplanted directly into mice after biopsy from the patient, allows for better modeling of the molecular features, heterogeneity, and pathology of the original tumor and for predicting treatment sensitivity. Additionally, it allows for the generation of models for tumor types that have not been amenable to cell line generation. Despite the many advantages of this approach for preclinical research, PDX mouse models are hindered by low engraftment rates and slow tumor growth kinetics. The loss of patient tumor heterogeneity and stromal cells as the PDX is passaged multiple times to generate sufficient tumor tissue to perform efficacy studies is also a disadvantage in the immunodeficient mouse models.

Led by Dr. Sharad Goyal, Dr. Jonathan Sherman (Neurosurgery) and Dr. Alejandro Villagra (Biochemistry and Molecular Medicine), this proof of concept study will demonstrate that genomic and molecular analysis can provide actionable insight to guide treatment decisions and that PDX models can serve as a unique platform to aid in therapeutic translation.



### A NEW HOPE FOR BRAIN CANCER PATIENTS

Neurosurgery and Radiation Oncology at GW are pioneering a more effective, safer approach to fighting brain cancer offering new hope to patients with certain types of tumors. Cesium-131 brachytherapy is part of an emerging treatment trend for high-functioning patients with large, symptomatic brain metastases or recurrent brain tumors.

Dr. Sharad Goyal calls this new approach a "revolutionary tool" to treat metastatic brain cancer. Cornell reported astounding results with a small study of metastatic brain cancer patients: At 18 months, the 24 patients showed no recurrence of brain cancer.

Equally important, none experienced radiation necrosis, a complication that occurs when over-radiated tissue dies, causing brain swelling. He notes that "it's safer for the patient, physicians and patient's loved ones. With a half-life of only 9.7 days compared to 60 days for iodine 125 - the radioisotope commonly used previously - cesium 131 works faster and in a shorter time frame, requiring fewer seeds." The combination of brain surgery and Cesium-131 implantation is delivered by a multi-disciplinary team at GW that includes neurosurgeons, radiation oncologists and medical physics to support the proper radiation dosing and delivery.

### SPOTLIGHT ON QUALITY IMPROVEMENTS IN RADIATION ONCOLOGY

**Timeouts:** Communication failures are an ongoing threat to patient safety. 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 December 2017 knowing that we were at a 70% compliance rate and set our ultimate goal of 100% compliance to be seen at June 2018, a 6-month overall time span. Although 100% compliance may not seem to be a realistic immediate goal, 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 built a system that supports a positive safety culture and encourages teamwork and direct communication.

**Clinical-Care Pathways:** Given that GW radiation oncology has seen a dramatic growth in patient volumes over the past 18 months, staffing levels need to be adjusted to reflect the workload, particularly in physics, dosimetry and treatment, where the demands have markedly increased.

In an effort to prevent unintentional clinical errors in radiation oncology, we have developed and implemented clinical-care pathways. With the goal to increase workflow and efficiency value-added steps have been identified, with wasteful steps and unnecessary stressors being eliminated to ensure quality patient care. This project was completed at the beginning of 2019 and has since then been implemented with a goal of reaching 100% compliance rate.

Following each consultation, at the time of simulation, a pathway is generated and specific task goals are presented to the appropriate staff member (i.e. Medical physicist, therapist, MD). Development of these published pathways ensured that all staff members were aware of each patients clinical care path and subsequently prevented "things from slipping through the cracks".

The clinical care path establishes a streamlined system of assigning tasks to the appropriate staff member for the efficient care and treatment of the patient. This care path is continued ensuring that appropriate patient documentation is completed as well. The implementation of the clinical care path has adequately provided another method of capturing patient activity, documentation, and staff accountability to provide the best patient care and safety in radiation oncology.



### **CLINICAL PROGRAMS**



#### HDR Brachytherapy

We are one of only a few centers in the DC Metro area to offer high dose rate (HDR) brachytherapy. Dr. Rao is the primary brachytherapist performing this procedure at GW. Our HDR program is thriving and is one of our fastest growing programs.

We offer cylinder brachytherapy, tandem and ovoid brachytherapy, as well as advanced brachytherapy for cervical cancer using the new Venezia applicator that allows for the placement of interstitial needles. We are also able to provide custom brachytherapy implants for head and neck, vaginal, vulvar, and skin cancers.

Our Radiation Oncology Center is equipped to offer the newest Electra Flexitron model a high dose rate (HDR) brachytherapy device and 3 adaptive techniques, which improves outcomes in gynecological cancers.

As part of our academic mission, we will open a prospectively maintained database of patients treated with HDR brachytherapy at GW, which we hope to use to help advance the treatment of cancer patients by optimizing patient selection and maximizing the therapeutic ratio.

For more information on our brachytherapy program, please contact Dr. Rao at yrao@mfa.gwu.edu or call (202) 715 5135.

#### **Stereotactic Radiosurgery**

At GW we have a long history of radiosurgery extending back to the early 1990's. The program was decommissioned for nearly 20 years until December 2017. Since then, we have treated over 120 patients. Initially used in the brain, improvements in the technology have allowed us to expand treatments to nearly all body sites.

Building upon our experience, we currently use fully three dimensional CT to CT online real time image fusion to further improve our set up accuracy. We combine the CT localization with our experience in the use of flattening filter free (FFF) radiation delivery to execute the radiation treatment in just minutes.

We use the Varian Truebeam STx<sup>™</sup> Accelerator, a machine dedicated to high precision radiosurgery with both single dose and fractionated capabilities and sub millimeter isocenter precision. Our frameless intracranial stereotactic cases are increasing as we incorporate improved patient monitoring and image guidance technology during treatment allowing for greater patient comfort by alleviating the need for an invasive stereotactic frame while maintaining millimeter level treatment accuracy.

Each of our cases involves close multidisciplinary input from our neurosurgeons, thoracic surgeons and other referring physicians.

For more information on radiosurgery at GW, please contact Dr. Sharad Goyal at shgoyal@mfa.gwu.edu or call 202 715 5051.

**RECENT GRAND ROUNDS** 



**Dr. Neil Taunk**, Assistant Professor of Radiation Oncology, University of Pennsylvania School of Medicine, spoke on the "Obstacles and Opportunities in Integrating Radiation Therapy as a Systemic Therapy" on April 5.



Dr. Drew Moghanaki, Associate Professor, Winship Cancer Institute, Emory University School of Medicine, spoke on the "Clear Obstacles and Hidden Challenges with Recruitment to Difficult Randomized Trials" on May 3.





**Dr. Philip Cuculich and Dr. Clifford Robinson**, of Washington University School of Medicine, gave a joint lecture and spoke on "Stereotactic Radiation VT Ablation" at the Cardiology grand rounds on February 27.





### SINDHU KUBENDRAN AWARDED HEALTH SERVICES SCHOLARSHIP

Sindhu Kubendran (MS2) received The GW School of Medicine and Health Sciences Health Services Scholarship in summer 2018. Under the mentorship of Dr. Sharad Goyal, she investigated whether there is a direct correlation between industry payments and physician productivity and success, as defined by total publications, h-index, or academic rank, for academic radiation oncologists. The Health Services Scholarship Program is designed to provide funding for summer experiential opportunities in areas such as health policy, medical education, and technology in medicine. For her efforts, she was awarded a \$2,500 scholarship.

### STAFF APPRECIATION: MS. APRIL BATISTE

Ms. April has been an employee of George Washington University Hospital since 1973 and a staff member for Radiation Oncology for 35 years. As a dedicated employee, Ms. April consistently demonstrates a love of our patients and for the work that she does.

"During my 18 years working with April, not only do I have a great employee to count on for her dedicated work, but I also found an amazing person to call friend. She is one of the most caring, compassionate and generous people I have ever met. She always remembers everyone's birthday and makes something personal to give as a present. I am proud to have her on my team", says Ms. Rana Kianni, manager of Radiation Oncology. Ms. Keyana Foster adds that, "Among consistently asking me how I am doing, [Ms. April] always transfers her caring spirit to each and every patient that comes to the clinic. I have enjoyed our many conversations and laughing with Ms. April each day.

April always transfers her caring spirit to each and every patient that comes to the clinic.



### Medical Student Rotation (RAD 386)

During this 3rd and 4th year rotation in Radiation Oncology, students work with attending physicians who specialize in treatment of a variety of disease sites.

Students actively participate in the work up, evaluation, and development of radiation treatment recommendations for patients seen in consultation for both curative and palliative intent.

Students learn basics of obtaining informed consent and participate in end of life or goals of care discussions. Students participate in patient simulations, treatment planning and dosimetry, and radiation treatments. They also participate in weekly departmental chart rounds, morning reports, procedures (brachytherapy or radiosurgery), and multi disciplinary tumor boards.

We would like to give a special thank you to the medical students that have rotated with us this past academic year: Chinwke Agbo, Vanya Aggarwal, Akrita Bhatnagar, Nicole Casasanta, Bhargava Chitti, Kurt Isaac Elder, Liqi Shu, Sameer Singhal, and Wahab Syed.

### Staff HIGHLIGHTS

Senator Angus <mark>K</mark>ing, Jr. and a few the senator Angus King, Jr. and a few the senator of our Radiation Oncology Jeam







Gizem Cifter, Rana Kianni & James Rao









# **GIVE THE GIFT OF HOPE**

### Your generosity advances medicine for you, your loved ones, and neighbors.

Philanthropic support makes our mission possible here at the GW Cancer Center. With the partnership of area corporations, foundations, federal and private research institutions, grateful patients and friends, we are able to continue providing high quality care and innovative research for the patients and families we serve.

Please consider joining our team with a gift to the Radiation Oncology Department today. Your generosity advances research efforts, establishment of a radiation oncology fellowship, patient assistance, an endowed faculty position, financial aid to students pursuing radiation oncology, and much more.

### FOR MORE INFORMATION CONTACT:

Arthur C.G. Hyland Office of Development and Alumni Relations (202) 994-7058 ahyland@gwu.edu

To make a gift online, visit **go.gwu.edu/gwcc** and indicate "radiation oncology fund" in the comments field.





### ABOUT THE GW CANCER CENTER

The George Washington University (GW) Cancer Center is a collaboration of the George Washington University, the GW Hospital and the GW Medical Faculty Associates to expand GW's efforts in the fight against cancer. The GW Cancer Center also incorporates all existing cancer-related activities at GW, with a vision to create a cancer-free world through groundbreaking research, innovative education and equitable care for all. Learn more about the GW Cancer Center at gwcancercenter.com.

### ABOUT GW RADIATION ONCOLOGY

GW Radiation Oncology offers our patients access to state-of-the-art therapies delivered in a compassionate, caring environment. GW Radiation Oncology is not only committed to delivering exceptional radiation therapy, but also to enhancing and improving upon the patient experience by providing a full range of clinical services and supportive programs. GW Radiation Oncology is located on GW's Foggy Bottom Campus which sits on about 18 square blocks in the heart of Washington, D.C., just blocks from the White House, John F. Kennedy Center for the Performing Arts, World Bank, and countless other national and international organizations. GW Radiation Oncology is integrated in every way of life in the nation's capital. For more information, visit bit.ly/GWRadOnc.



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