

A long-exposure photograph of Washington, D.C. at night. The Washington Monument stands prominently in the center background, illuminated against the dark sky. The city lights of Washington D.C. are visible in the background, with the Potomac River in the middle ground. In the foreground, a multi-lane highway shows light trails from moving vehicles, and a large, modern building complex is visible. The overall scene is a blend of urban architecture and natural landscape.

2020 **GW RADIATION ONCOLOGY** ANNUAL UPDATE

THE GEORGE WASHINGTON UNIVERSITY CANCER CENTER



ABOUT THE GEORGE WASHINGTON UNIVERSITY 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.org.

ABOUT GW RADIATION ONCOLOGY

GW Radiation Oncology offers 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 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 in the heart of Washington, D.C. To learn more, visit bit.ly/GWRadOnc.

The George Washington University does not unlawfully discriminate against any person on any basis prohibited by federal law, the District of Columbia Human Rights Act, or other applicable law, including without limitation, race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity or expression, genetic information, pregnancy, or familial or marital status. This policy covers all programs, services, policies, and procedures of the university, including admission to education programs and employment.

CONTENTS

Letter from the Division Director	2
Meet Our Providers	4
Clinical Updates	6
In Memoriam - Luther W. Brady	8
Quality Improvement in Radiation Oncology	10
Education and Training	11
Clinical Programs	12
Staff and Student Updates	14
Research Roundup	16
In Recognition	20
Staff Highlight	21
Rising to the Challenge	22
Patient Experience Survey	24



LETTER FROM THE **DIVISION DIRECTOR**

Courage. Empathy. Discipline. Innovation. These values have seen us through times of triumph and times of fear and uncertainty. Together, these values will help us overcome the challenges we face today in the COVID-19 pandemic.

The first reported case of COVID-19 was reported in Washington, D.C. on March 7, 2020. Given the constantly changing regulatory, supply chain and other pandemic-related constraints, we had to rapidly develop, implement and evolve our policies here at GW Radiation Oncology alongside the pandemic. Although it has been challenging, COVID-19 has given us an opportunity to create one novel, flexible and proactive division dedicated to excellence in all cancer types.

We have been driven to fulfill our mission of providing excellent care, driving change in health care delivery through scientific innovation and training tomorrow's physicians to provide that care. We have also been re-examining all of our assumptions about patient care, and how we turn the phrase "bench to bedside" into a reality.

First, we launched telehealth options for patients and rescheduled non-urgent radiation therapy, procedures and visits to keep our patients, community and region healthy and safe. To prepare for the potential need for health care workers to be quarantined, sick or absent, we deployed virtual health tools so that clinicians can continue to care for non-exposed cancer patients by converting scheduled office visits to virtual health visits.

INNOVATION AND MOBILIZATION

Telemedicine visits can be done with both patient and provider at home, greatly limiting travel and exposure while still maintaining continuity of care. This has been particularly important for many of our most vulnerable patients

After seeing the N95 mask shortage gripping the nation's health care workers, GW Radiation Oncology and the Department of Biomedical Engineering in the GW School of Engineering and Applied Science have mobilized to create 3D printed face mask and face shield solutions to ensure the safety of health care workers. Led by Yuan James Rao, MD and biomedical engineering PhD candidate Destie Provenano, this effort led to the development of a successful prototype within days, and full production of hundreds of reusable N95 respirators within a week. This is simply a concrete example of "bench to bedside" in action.

During this pandemic, we have had to make and hear difficult decisions. I am so grateful for everyone working on the front lines, and for the many colleagues and supporters who have shown dedication, grit and resilience under these unprecedented circumstances.

MOVING FORWARD

The COVID-19 pandemic has shone a spotlight on health disparities that are amplified by systemic racism, discrimination and social injustice. As health care providers, we can no longer turn a blind eye to systemic racism and violence against people of color. We must acknowledge the reality that racism is woven in the fabric of this country and must be confronted openly.

Health care remains an essential piece of the puzzle in fighting against injustice. As providers, we remain committed to treating our patients with dignity and respect. We also commit to using our voices to speak out about the injustices and health disparities that disproportionately affect the communities we serve.

I find tremendous hope in the strength and resilience of the GW faculty and staff working to see us through these difficult times. This is a defining moment for GW and for our community. Our efforts today and in the months to come will heal and sustain our city, our region and our world.



Sharad Goyal, MD

Though we're standing six feet apart,
we can do this together.

MEET OUR PROVIDERS

GW Radiation Oncology offers the highest level of radiation delivery and care to patients. Our providers are committed to the practice of evidence-based medicine and offering patients with a wide range of radiation oncology services. For patient appointments, please contact our intake coordinator at (202) 715-5097.



SHARAD GOYAL, MD

**Professor of Radiology and Neurosurgery
Division Director, Radiation Oncology**

Dr. Goyal's specialties include breast and central nervous system cancers. He also treats complex cases, like rare tumors or patients who need re-irradiation. His research focuses on improving the quality of care received by cancer patients and survivors by advancing the ways in which cancer is treated with radiation.



MARTIN OJONG-NTUI, MD

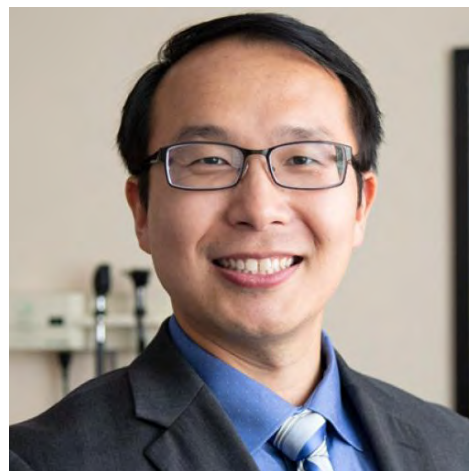
Assistant Professor of Radiology

Dr. Ojong-Ntui's specialties include breast and genitourinary cancers, as well as palliative care.

YUAN JAMES RAO, MD

Assistant Professor of Radiology
Director of Brachytherapy

Dr. Rao's specialties include genitourinary, gynecological and head and neck cancers. He has a particular interest in the curative treatment of cancers using brachytherapy.



DIANA SCULLY, FNP-C

Family Nurse Practitioner

Ms. Scully specialties include women's health, breast and gynecological cancer and cancer survivorship. She is board certified by the American Association of Nurse Practitioners as a family nurse practitioner.



MINH-PHUONG HUYNH-LE, MD

Assistant Professor of Radiology

Dr. Huynh-Le will join GW Radiation Oncology in September 2020. She received her medical degree from the Johns Hopkins School of Medicine and completed her radiation oncology residency training at the University of San Diego. She will primarily be specializing in lung, thoracic and gastrointestinal cancers.



Manager

Rana Kianni, RTT

Reception & Front Desk

April Batiste

Judith Thompson

Nursing

Shamel Boston, CNA

Administrative

Jelavonda Doy

Jenna Breitstein (PGA)

Keyana Foster

Medical Physics

Gizem Cifter, PhD

Hamid Aghdam, MS

Mehrdad Sarfaraz, PhD (Chief)

Radiation Therapists

Carly Dugan, RTT

Emebet Seleshi, RTT

Janette Blanco, RTT

Joseph Phelan, RTT

Sirak Woldetsadik, RTT

Steven Salama, RTT

CLINICAL UPDATES

From minimally invasive radiotherapy options that cut treatment time, to image-guided brachytherapy - GW Radiation Oncology is always looking for ways to optimize patient care.



QUARTERLY MEETINGS

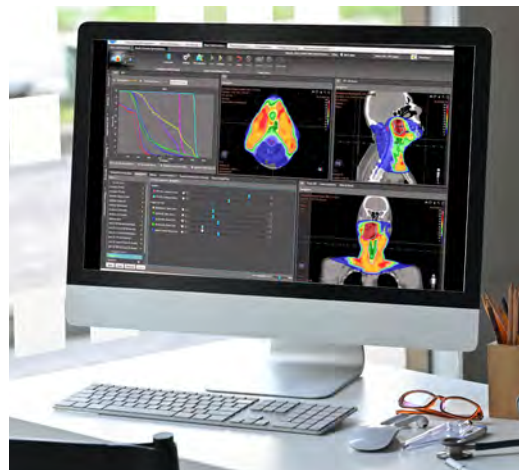
Process review and improvement is critical to ensure high quality care for patients. In alignment with this philosophy, in July 2019, we instituted a quarterly morbidity and mortality conference, journal club, and loco-regional failure rounds. Attendings, medical physicists, nurses, and therapists make up a diverse cohort of patient care professionals who participate in our quality assurance and quality improvement meetings.

Each case of morbidity, mortality, and locoregional failure in the previous quarter is presented by the treating radiation oncologist. After a brief discussion of the patient's treatment course, we utilize our treatment planning system to view the patient's treatment plan, which is overlaid and registered with the recent imaging study that depicts the disease progression.

Our goal is to maximize the impact of peer review on patient outcomes as well as facilitate educational opportunities for all staff.

SOFTWARE UPGRADES

In January 2020, we implemented clinical use of the RayStation treatment planning system. RayStation offers a full array of radiotherapy treatment planning tools for linac-based radiotherapy treatments, including automated planning and multi-criteria optimization to improve efficiency and plan quality. RayStation makes adaptive planning more efficient and allows us to extend adaptive radiotherapy to a larger number of patients. RayStation is being used to perform treatment planning for a wide variety of cancer sites.



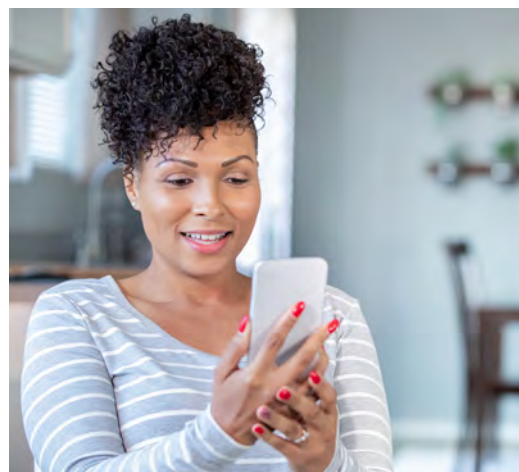
NOW OFFERING VIRTUAL CARE

GW Radiation Oncology now offers virtual care services, including telemedicine appointments for cancer patients who need radiation therapy.

Patients should call (202) 715-5097 to schedule an appointment. The intake coordinator will then schedule a Zoom session with the patient to determine which provider's clinical background and specialties most closely align with the patient's oncology needs. Virtual appointments are provided on a secure, HIPAA-compliant platform.

During the current COVID-19 pandemic, we are using approaches to minimize the number of radiation sessions needed for treatment and limit side effects. We collaborate closely with highly trained medical physicists to create an individualized treatment plan for every patient.

To learn more, visit bit.ly/GWRadOnc or call (202) 715-5097.



IN MEMORIAM **LUTHER W. BRADY**

Luther W. Brady, a George Washington University triple alumnus, trustee emeritus, world-renowned radiation oncologist, and passionate advocate for the arts, died July 13, 2018 at the age of 92.



Luther W. Brady, pictured at a ceremony in May 2015 when he received the university President's Medal. (GWToday)

A longtime GW volunteer and donor, Luther W. Brady, Jr., MD '48, BA '46, AA '44, HON '04, remained actively involved in his alma mater during his life, including as a member of the Board of Trustees and through his support of the School of Medicine and Health Sciences and the Luther W. Brady Art Gallery.

Brady was born in North Carolina and received his undergraduate and medical degrees from George Washington University in Washington, DC. He received his training in Radiology, Radiation Oncology and Nuclear Medicine at the US Naval Hospital in Bethesda and in Philadelphia at Jefferson Medical College and the University of Pennsylvania. His career of teaching and clinical work spanned more than 50 years at Hahnemann University School of Medicine and continued at Drexel University College of Medicine in Philadelphia. He served as department chair from 1970 until he stepped down in 1996.

Brady's contributions as an educator and clinician made him an internationally recognized leader in the field of Oncology. He was an innovator and especially known for the establishment of modern radiation oncology treatments of eye tumors, cervical cancer, iodine and ruthenium eye plaque brachytherapy, moulage techniques, early use of monoclonal antibodies with and without radiation in conjunction with the Wistar institute, and interstitial brain implants. He also pioneered treatment of pediatric patients without the use of systemic anesthesia.



Guests view vivid, abstract works on display at "Full Circle" in the Brady Gallery's Flagg Building home. (Sydney Elle Gray/GW Today)

In his 80s, he started one of the nation's first Cyber-knife Radiosurgery programs. He has over 600 publications and credits, was editor of the Encyclopedia of Radiation Oncology, was co-editor with Carlos Perez, MD, of Principles and Practice of Radiation Oncology and served for two decades as the editor of the American Journal of Clinical Oncology.

Brady's interest in the arts led to his support of the Luther W. Brady Art Gallery and helped it to grow and attract internationally recognized artists, such as Sean Scully, Howard Hodgkin, John Hubbard, and Michael Craig-Martin.

Brady supported talented emerging artists, built productive bridges between arts institutions, provided able leadership to many museum boards and contributed philanthropic support to a wide variety of beneficiaries. These ranged from the

National Gallery of Art to the Opera Company of New Mexico to the Philadelphia Museum of Art, as well as the George Washington University Museum and The Textile Museum, of which Dr. Brady served as a member of the Board of Directors.

Brady will be remembered by all who knew him and worked with him as an incomparable and wise mentor and friend with a keen sense of what was truly important in this world. We can best honor this amazing physician by continuing his legacy of excellence in our specialty, caring for and about our patients and guiding others in the field. His dedication to his patients, colleagues and friends was obvious and will serve as a guiding light for us all. Brady will truly be missed.

QUALITY IMPROVEMENT IN RADIATION ONCOLOGY

By implementing a specialized breathing technique for patients with left-sided breast cancer undergoing radiation therapy, researchers saw a significant decrease in radiation dose to the heart and lungs.

Historically, heart dose from left-sided breast radiotherapy has been associated with a risk of cardiac injury. Data suggest that there is not a threshold for the deleterious effects from radiation on the heart. Over the past several years, advances in radiation delivery techniques have reduced cardiac morbidity due to treatment.

GW Radiation Oncology developed and implemented the Deep Inspiration Breath Hold (DIBH) program in December 2017. DIBH is a technique that takes advantage of a more favorable position of the heart during inspiration to minimize heart doses over a course of radiation therapy.

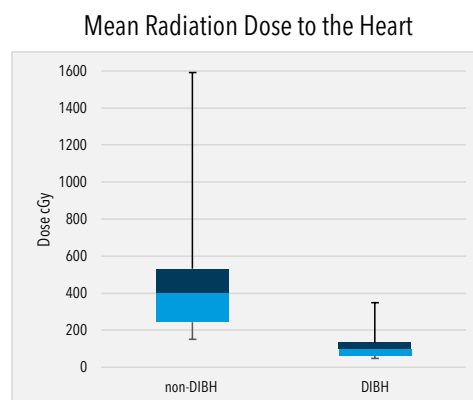
Evaluation of the clinical impact to patients receiving their radiation through this technique was an important aspect of clinical decision-making. It also allowed us to identify successes and implement any necessary departmental changes based on our findings.

Data from January 2017 through December 2017 were analyzed for the non-DIBH technique. This data included all physicians in the practice. The DIBH technique was initiated for patients between January 2018 and December 2018.

The primary aim of this study was to measure the radiation dose outcome in critical structures, including the heart and lung, for patients being treated with left-sided breast cancers.

Current literature has shown that patients treated with a DIBH technique received the prescribed radiation dose to the treatment target, while decreasing the dose to healthy tissues of the heart and left lung (Tang et al., 2015). Additionally, thorough patient selection, a robust patient education plan, and increased experience level of staff have also been shown to decrease treatment time for some patients.

Comparative data between non-DIBH and DIBH patients showed a significant difference in radiation dose exposure for the heart and lung. The mean radiation dose to the heart for non-DIBH patients was 417.24 cGy compared to 104.62 cGy for DIBH patients. This change in the mean radiation dose to the heart was statistically significant ($9.31409E-14$ in an unequal variance t-test (*= p -value <0.05 , **= p -value <0.01).



EDUCATION AND TRAINING

MID-ATLANTIC RADIATION ONCOLOGY CONSORTIUM

GW Radiation Oncology hosted the second Mid-Atlantic Radiation Oncology Consortium on Nov 6, 2019 at the Ritz-Carlton Georgetown. The meeting was developed to inform radiation oncologists, medical physicists, dosimetrists, residents, and students in the metropolitan Washington, D.C., area about the most recent advances in radiation oncology research and applications to treatment. Over 70 guests attended to learn together, foster cooperation, exchange ideas, and network with colleagues. It is the only regional symposium for radiation oncology in the area.

The keynote speaker was Robert C. Miller, MD, medical director of the Maryland Proton Treatment Center at the University of Maryland, who spoke on Proton and FLASH radiotherapy. This was followed by a panel of speakers including Sameer Kanani, MD, from Inova Radiation Oncology; Jonathan Sherman, MD, FAANS, FACS, of GW Neurosurgery; and Deepa Subramanian, MD, of Georgetown Medical Oncology. Panelists discussed "Challenging Cases in Brain Metastases." Many thanks to Robert Siegel, MD, and Leo Schargorodski for their leadership and support in putting on this event.



Please contact Sharad Goyal, MD, at shgoyal@mfa.gwu.edu or call (202) 715-5051 for more information about educational opportunities in radiation oncology.

MEDICAL STUDENT ROTATION (RAD 386)

During the third and fourth years of medical school, students in SMHS work with attending physicians in GW Radiation Oncology 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, as well as learning the basics of informed consent and navigating 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 multidisciplinary tumor boards.



Thank you to all of the outstanding medical students that rotated with us this past academic year: Sindhu Kubendran, Patrick Dunn, Peter Shahid, and Ryan Jespersen (1-day shadow).

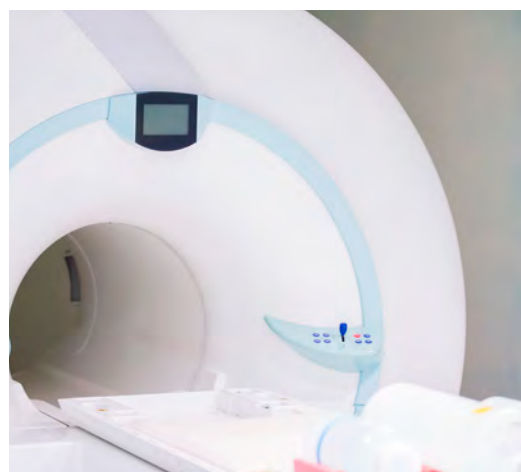
CLINICAL PROGRAMS

For more information about GW Radiation Oncology's clinical programs, please contact Yuan James Rao, MD, at yrao@mfa.gwu.edu or call (202) 715-5135.

SHORT COURSE RADIATION THERAPY

GW Radiation Oncology now offers a four week short course radiation therapy regimen for patients with low to favorable intermediate risk prostate cancer. Radiation therapy for prostate cancer typically consists of 39 to 42 treatments over the course of eight or nine weeks. During short course radiation therapy, eligible patients receive a course of 20 daily treatment fractions over four weeks. Precision Image Guided Radiotherapy (IGRT) is delivered utilizing permanent fiducial markers as well as the SpaceOAR™ Hydrogel system for additional protection of critical healthy tissue. Patients should be candidates for the SpaceOAR™ system.

Short course radiation therapy cuts the course of treatment nearly in half, making it more convenient for patients, particularly those traveling from a distance. Moderate hypofractionation (short course radiotherapy) holds important potential advantages for patient convenience and resource utilization. Based on high quality evidence, task force consensus was reached that “moderately hypo-fractionated radiation therapy should be offered to patients who choose EBRT [external beam radiation therapy] for treatment of prostate cancer.”



HDR BRACHYTHERAPY

GW Radiation Oncology is one of only a few centers in the Washington, D.C., metro area to offer high dose rate (HDR) brachytherapy. Yuan James Rao, MD, is the primary brachytherapist performing this procedure at GW. HDR therapy is thriving and is one of our fastest growing services.

We offer cylinder brachytherapy, tandem and ovid brachytherapy, and advanced brachytherapy for cervical cancer using the new Venezia applicator that allows for the placement of interstitial needles. We provide custom brachytherapy implants for head and neck, vaginal, vulvar, and skin cancers. We also offer the newest Electra Flexitron model, a HDR brachytherapy device, and three adaptive techniques to improve outcomes in gynecological cancers.

As part of our academic mission, we plan to create a database of patients treated with HDR brachytherapy at GW, with the goal of advancing the treatment of cancer patients by optimizing patient selection and maximizing the therapeutic ratio.



IMAGE-GUIDED BRACHYTHERAPY

The Zephyr Patient Positioning and Transfer System was purchased and implemented in February 2020. The Zephyr HDR system utilizes patented hover technology to allow patient transfer from imaging to treatment while maintaining patient positioning and minimizing the risk of needle or applicator displacement. The Zephyr system allows therapists to safely and accurately move patients during treatment using air-bearing technology to transfer patients from computed tomography couch top, to patient stretcher, to high dose rate brachytherapy table. This minimizes changes in implant geometry during patient transfer, which allows for greater treatment accuracy, reduced staff requirements and injuries, and increased patient comfort and safety.



STAFF AND STUDENT UPDATES



Congratulations to Bhargava Chitti, MD, for his upcoming residency training in Radiation Oncology at Northwell Health in New York, NY. Chitti graduated from the GW School of Medicine and Health Sciences in May 2020. Chitti rotated with us in Rad 386 last year. Congratulations and best wishes to all GW SMHS students who matched in 2020.



Gizem Cifter, PhD, recently passed the second of her boards in therapeutic medical physics from the American Board of Radiology. Dr. Cifter expects to take the third portion of her boards in fall 2020. The oral exam emphasizes clinical medical physics, clinical judgment, and communication.



Congratulations and best wishes to Yuan James Rao, MD, and Destie Provenzano on their March 14, 2020 wedding in Washington, D.C.



Sirak Woldetsadik, radiation therapist, and Feruz Mohammad were married on Jan 11, 2020 in Springfield, Virginia. We wish them a happy and blessed marriage.



We now offer an elective for students in the Physician Assistant Program at the GW School of Medicine and Health Sciences. As a knowledgeable and skilled member of the health care team, physician assistants can improve patients' access to health care and enhance physician effectiveness. We are very pleased to have established this relationship.



RESEARCH ROUNDUP



Researchers from GW Radiation Oncology are on the front lines of investigating the most innovative approaches to radiation therapy. We are always pushing the clinical and technological envelope forward for the benefit of our patients.

PUBLISHED MANUSCRIPTS

Sutaria, T., Sparks, A.D., Rao, Y.J., Lopez-Acevedo, M., & Long, B. (2020). Trends in guideline-adherent fertility-sparing surgery for early-stage cervical cancer before and after the Affordable Care Act. *Gynecologic Oncology*. <https://doi.org/10.1016/j.ygyno.2020.05.027>

Sterling, J., Rivera-Núñez, Z., Patel, H.V., Farber, N.J., Kim, S., Radadia, K.D., Modi, P.K., Goyal, S., Parikh, R., Weiss, R.E., Kim, I.Y., Elsamra, S.E., Jang, T.L., & Singer, E.A. (2020). Factors associated with receipt of partial nephrectomy or minimally invasive surgery for patients with clinical T1a and T1b renal masses: Implications for regionalization of care. *Clinical Genitourinary Cancer*. <https://dx.doi.org/10.1016/j.clgc.2020.03.011>.

Srivastava, A., Rivera-Núñez, Z., Kim, S., Sterling, J., Farber, N.J., Radadia, K.D., Patel, H.V., Modi, P.K., Goyal, S., Parikh, R., Mayer, T.M., Saraiya, B., Sadimin, E.T., Weiss, R.E., Kim, I.Y., Elsamra, S.E., Jang, T.L., & Singer, E.A. (2020). Impact of pathologic lymph node-positive renal cell carcinoma on survival in patients without metastasis: Evidence in support of expanding the definition of stage IV kidney cancer. *Cancer*, 126(13), 2991-3001. <https://dx.doi.org/10.1002/cncr.32912>.

Poppe, M.M., Yehia, Z.A., Baker, C., Goyal, S., Toppmeyer, D., Kirstein, L., Chen, C., Moore, D.F., Haffty, B.G., & Khan, A.J. (2020). 5-year update of a multi-institution prospective Phase II hypofractionated post-mastectomy radiation therapy trial. *International Journal of Radiation Oncology, Biology, Physics*, 107(4), 694-700. <https://dx.doi.org/10.1016/j.ijrobp.2020.03.020>.

Provenzano, D., Washington, S.D., Rao, Y.J., Loew, M., & Baraniuk, J. (2020) A machine learning approach to the differentiation of functional magnetic resonance imaging data of Gulf War illness from a sedentary control. *Brain Sciences*, 14(2), 1-13. <https://dx.doi.org/10.3389/fncom.2020.00002>

Rudra, S., Fuser, D., DeWees, T., Wan, L., Gang, M., Hui, C., Rao, Y.J., Siegel, B., Dehdashti, F., Mutch, D., Powell, M., Schwarz, J., Grigsby, P., Chen, D., & Markovina, S. (2020). Radiologic assessment of groin lymph nodes in pelvic malignancies. *International Journal of Gynecological Cancer*, 30(7), 947-953. <https://dx.doi.org/10.1136/ijgc-2020-001363>

Provenzano, D., Rao, Y.J., Mitic, K., Obaid, S.N., Pierce, D., Huckenpahler, J., Berger, J., Goyal, S., & Loew, M.H. (2020). Rapid prototyping of reusable 3D-printed N95 equivalent respirators at the George Washington University. *Preprints*. <https://dx.doi.org/10.20944/preprints202003.0444.v1>

Rao, Y.J., Provenzano, D., Gay, H.A., Read, P.W., Ojong, M., & Goyal, S. (2020). A radiation oncology departmental policy for the 2019 novel coronavirus (COVID-19) pandemic. *Preprints*. <https://dx.doi.org/10.20944/preprints202003.0350.v1>

Chitti, B., Goyal, S., Sherman, J.H., Caputy, A., Sarfaraz, M., Cifter, G., Aghdam, H., & Rao, Y.J. (2020). The role of brachytherapy in the management of brain metastases: A systematic review. *Journal of Contemporary Brachytherapy*, 12(1):67-83. <https://dx.doi.org/10.5114/jcb.2020.93543>

Kim, M.M., Parmar, H.A., Schipper, M., Devasia, T., Aryal, M.P., Kesari, S., O'Day, S., Morikawa, A., Spratt, D.E., Junck, L., Mammoser, A., Hayman, J.A., Lawrence, T.S., Tsien, C.I., Aiken, R., Goyal, S., Abrouk, N., Trimble, M., Cao, Y., Lao, C.D. (2020). BRAINSTORM: A multi-institutional Phase I/II study of RRx-001 in combination with whole brain radiation therapy for patients with brain metastases. *International Journal of Radiation Oncology Biology Physics*. 107(3), 478-486. <https://dx.doi.org/10.1016/j.ijrobp.2020.02.639>

Goyal, S., Kubendran, S., Kogan, M., & Rao, Y.J. (2020). High expectations: The landscape of clinical trials of medical marijuana in oncology. *Complementary Therapies in Medicine*. 49, 102336. <https://dx.doi.org/10.1016/j.ctim.2020>

Bekelman, J.E., Lu, H., Pugh, S., Baker, K., Berg, C.D., de Gonzalez, A.B., Braunstein, L.Z., Bosch, W., Chauhan, C., Ellenberg, S., Fang, L.C., Freedman, G.M., Hahn, E.A., Haffty, B.G., Khan, A.J., Jimenez, R.B., Kesslering, C., Ky, B., Lee, C., Lu, H.M., Mishra, M.V., Mullins, C.D., Mutter, R.W., Nagda, S., Pankuch, M., Powell, S.N., Prior, F.W., Schupak, K., Taghian, A.G., Wilkinson, J.B., MacDonald, S.M., & Cahlon, O. (2019) Pragmatic randomised clinical trial of proton versus photon therapy for patients with non-metastatic breast cancer: the Radiotherapy Comparative Effectiveness (RadComp) Consortium trial protocol; RadComp (Radiotherapy Comparative Effectiveness Consortium). *BMJ Open*, 9(10), e025556. <https://dx.doi.org/10.1136/bmjopen-2018-025556>

Bochenek-Cibor, J., Georgiew, F., & Goyal, S. (2020). A retrospective analysis on safety and effectiveness of hypofractionated post-mastectomy radiotherapy. *Breast Journal*, 26(2), 176-181. <https://dx.doi.org/10.1111/tbj.13494>

From COVID-19 to the latest treatment advances,
GW researchers are on the case.



PUBLISHED MANUSCRIPTS (CONTINUED)

Radadia, K.D., Rivera-Núñez, Z., Kim, S., Farber, N.J., Sterling, J., Falkiewicz, M., Modi, P.K., Goyal, S., Parikh, R., Weiss, R.E., Kim, I.Y., Elsamra, S.E., Jang, T.L., & Singer, E.A. (2019). Accuracy of clinical nodal staging and factors associated with receipt of lymph node dissection at the time of surgery for nonmetastatic renal cell carcinoma. *Urologic Oncology*, 37(9), 577.e17-577.e25. <https://dx.doi.org/10.1016/j.urolonc.2019.06.003>.

Gupta, A., Khan, A.J., Yegya-Raman, N., Sayan, M., Ahlawat, S., Ohri, N., Goyal, S., Moore, D.F., Eladounikdachi, F., Toppmeyer, D., & Haffty, B.G. (2019). 5-Year results of a prospective Phase 2 trial evaluating 3-week hypofractionated whole breast radiation therapy inclusive of a sequential boost. *International Journal of Radiation Oncology Biology Physics*, 105(2), 267-274. <https://dx.doi.org/10.1016/j.ijrobp.2019.05.063>

Gupta, A., Kan, A.J., Goyal, S., Millevoi, R., Elsebai, N., Jabbour, S.K., Yue, N.J., Haffty, B.G., & Parikh, R.R. (2019). Insurance approval for proton beam therapy and its impact on delays in treatment. *International Journal of Radiation Oncology Biology Physics*, 104(4), 714-723. <https://dx.doi.org/10.1016/j.ijrobp.2018.12.021>

OTHER PUBLICATIONS AND PRESENTATIONS

Book Chapters

Goyal, S., Rao, Y.J., Huynh-Le, M.P., & Kanani, S. (2020). External beam radiation therapy for tumors of the spine. In *Spine and spinal cord tumors: Classification, management, and treatment*. Thieme Medical Publishing.

Presentations

The following abstracts from the GW Radiation Oncology Program were selected for presentation in the digital poster viewing Q&A session of the 2020 American Society for Radiation Oncology (ASTRO) Annual Meeting held October 25-28, 2020 at the Miami Beach Convention Center.

"The relationship between industry payments on research productivity and career success of academic radiation oncologists"

Presenter: Sindhu Kubendran

Authors: Sindhu Kubendran, Yuan Rao, Avi Dor, Martin Ojong-Ntui, Sharad Goyal

"Incidence and prognosis of brain metastases in head and neck cancer patients at diagnosis: a population-based study"

Presenter: Ian Messing

Authors: Ian Messing, Sharad Goyal, Jonathan Sherman, Punam Thakkar, Robert Siegel, Arjun Joshi, Joseph Goodman, Martin Ojong-Ntui, Yuan Rao

"Use of distress thermometer to predict utilization of emergency room services and treatment delays in head and neck cancer patients undergoing radiation therapy"

Presenter: Abigail Pepin

Authors: Abigail Pepin, Sharad Goyal, Punam Thakkar, Robert Siegel, Arjun Joshi, Joseph Goodman, Martin Ojong-Ntui, Yuan Rao

"Adverse events of after-loading high dose rate brachytherapy reported to the United States Food and Drug Administration (FDA)"

Presenter: Destie Provenzano

Authors: Destie Provenzano, Kevin Rao, Gizem Cifter, Mehrdad Sarfaraz, Hamid Aghdam, Martin Ojong-Ntui, Murray Loew, Sharad Goyal, Yuan Rao

CLINICAL TRIALS

EA3161 - A Phase II/III Randomized Study of Maintenance Nivolumab versus Observation in Patients with Locally Advanced, Intermediate Risk HPV Positive OPCA

Compassionate Use - Capmatinib for Non Small Cell Lung Cancer with a MET Exon 14 Skipping Mutation After Progression on Crizotinib

MK3475-689 - A Phase III, Randomized, Open-label Study to Evaluate Pembrolizumab as Neoadjuvant Therapy and in Combination With Standard of Care as Adjuvant Therapy for Stage III-IVA Resectable Locoregionally Advanced Head and Neck Squamous Cell Carcinoma (LA HNSCC)

NRG-NB003 - Phase III Trial of Observation Versus Irradiation for a Gross Totally Resected Grade II Meningioma

NRG-GU006 - A Phase II, Double-Blinded, Placebo-Controlled Randomized Trial of Salvage Radiotherapy with or without Enhanced Anti-Androgen Therapy with Apalutamide in Recurrent Prostate Cancer

NRG-GU007 - Randomized Phase II Trial of Niraparib with Standard Combination Radiotherapy and Androgen Deprivation Therapy (ADT) in High Risk Prostate Cancer (with initial Phase I)

R2810-ONC-1788 - A Randomized, Placebo-Controlled, Double-Blind Study of Adjuvant Cemiplimab versus Placebo After Surgery and Radiation Therapy in Patients with High Risk Cutaneous Squamous Cell Carcinoma

R2810-ONC-1901 - A Phase II Study of Neoadjuvant Cemiplimab for Stage II to IV (M0) Cutaneous Squamous Cell Carcinoma (CSCC)

A221505 - RT Charm: Phase III Randomized Trial of Hypofractionated Post Mastectomy Radiation with Breast Reconstruction

Prevlar - Prevlar: A Phase IIa Randomized, Parallel Group, Open-Label, Multicenter Study to Assess the Safety and Efficacy of Different Schedules of RRx-001 in the Attenuation of Oral Mucositis in Patients Receiving Concomitant Chemoradiation for the Treatment of Locally Advanced Squamous Cell Carcinomas of the Oral Cavity or Oropharynx

EA2165 - A Randomized Phase II Study of Nivolumab After Combined Modality Therapy (CMT) in High Risk Anal Cancer



To inquire about enrolling your patient in a clinical trial, please contact Dr. Goyal at shgoyal@mfa.gwu.edu or call (202) 715-5051.

IN RECOGNITION



Sharad Goyal, MD, was appointed chair of credentialing at the GW Medical Faculty Associates (MFA), where he helps develop, monitor, and maintain standards for the education, training, and licensure of the 700+ physicians and advanced practitioners at the MFA. In addition, he helps establish and maintain credentialing/re-credentialing policies consistent with National Committee for Quality Assurance (NCQA) standards, as well as applicable state and federal rules and regulations.



Elekta, a leader in precision radiation medicine, recently donated personal protective equipment (PPE) to Jeffrey Berger, MD, MBA, chair of the Department of Anesthesiology and Critical Care Medicine at GW, whose team is on the front lines of the COVID-19 pandemic. The donation came from Anming Gong, executive vice president, China region of Elekta. The pandemic hit hard for Gong, who received his MSc in Biomedical Engineering at the Huazhong University of Science and Technology in Wuhan, China.



GW Radiation Oncology would like to thank Cotton & Reed Rum Distillery and One Eight Distilling, LLC, for donating distillery-made hand sanitizer for use by patients.



In July 2019, Ellen D. Yorke, PhD, received the Edith H. Quimby Award at the American Association of Physicists in Medicine annual meeting in San Antonio, Texas. This award recognizes members who have significant scientific achievement in medical physics, influence on the professional development of the careers of other medical physicists, and/or leadership in national or international organizations. Yorke was full-time medical physicist in GW Radiation Oncology from 1985 to 1997.



In 2019, the Luther W. Brady Art Gallery at GW lent GW Radiation Oncology two collages by Sam Maitin, a teacher, artist, and friend to Luther Brady, MD '48, BA '46, AA '44, HON '04. Brady was a GW triple alumnus, trustee emeritus, world-renowned radiation oncologist, and passionate advocate for the arts. The collages, intended to uplift patients undergoing radiation treatments, hang in the GW Radiation Oncology reception area.



STAFF HIGHLIGHT

Hamid Aghdam is a medical physicist who has worked with GW Radiation Oncology for nearly 33 years.

Hamid Aghdam emigrated to the United States from Iran and first attended GW in 1977. He received his bachelor of science and master's degrees in mechanical engineering from GW, and then pursued a PhD in medical engineering. As a dosimetrist and medical physicist, Aghdam trained under two well-known GW physicists, Ellen Yorke, PhD, and Barry Wessels, PhD. In 2006, he took on the role of treatment planning physicist in GW Radiation Oncology.

Specializing in the physics of intensity modulated radiation therapy (IMRT) and 3D-conformal radiation therapy (3D-CRT), Aghdam served as president of the Mid-Atlantic Chapter of the American Association of Physicists in Medicine in 2003. He has been a key member responsible for the brachytherapy and treatment planning platforms since the adoption of RayStation treatment planning software in January 2020.

Martin Ojong, MD, nominated Aghdam for a service excellence award from the GW Hospital, where he upholds quality patient care to the highest degree. He is a beloved physicist, devoted husband to wife Patricia, and father to four children, Cyrus, Layla, Noah, and Hannah. Often called "the life of the party," we would like to thank Hamid for his dedication to Radiation Oncology, the GW Hospital, and the many patients we treat each day.

RISING TO THE **CHALLENGE**

By Katherine Dvorak

When the COVID-19 pandemic hit, Yuan James Rao, MD, and Destie Provenzano chose to forego their honeymoon and used their expertise to help health care workers on the front lines.



When planning their wedding, Yuan James Rao, MD, director of brachytherapy at GW Radiation Oncology and assistant professor of radiology at the GW School of Medicine and Health Sciences (SMHS), and Destie Provenzano, a PhD candidate in the GW Department of Biomedical Engineering, had no idea the day would land amid a global health crisis.

Their reception, held in mid-March at Sequoia Restaurant on the Georgetown Waterfront, became a small affair, only close friends, family, and some coworkers were on hand to celebrate the pair's nuptials. Canceled meals were donated to a homeless shelter, and they were flooded with apologetic emails and texts from family and friends who could not make it to the celebration.

In addition to altering their wedding day, the virus led them to cancel their honeymoon, which originally was going to include a relaxing cruise. When COVID-19 stopped that plan in its tracks, Rao and Provenzano were determined to make the most of their time and do what they could to help others.

Both have family, friends, and colleagues working in the health care space; Provenzano's parents and two sisters are physicians, while Rao's father is a physician and his mother is a nurse.

"We have been very concerned that our family and other health care providers will be impacted by COVID-19, and we wanted to spend the time we had off work to do what we could to help," Rao said.





Rao noted he has been following COVID-19 since it first appeared in Wuhan, China, and after the virus spread to the United States, he realized that GW's radiation oncology unit did not have policies in place to help keep patients safe from the virus.

"Radiation therapy typically requires several weeks of treatment, so special policies needed to be put in place to protect our patients and staff," he said. "Destie and I wrote up these policies with Dr. Sharad Goyal [director of the Division of Radiation Oncology at GW], and they were implemented within a day."

The policies were developed in conjunction with Washington University in St. Louis and the University of Virginia, and have been published online to help other radiation oncology departments in their policymaking.

In addition, Provenzano and Rao quickly saw the impact limited personal protective equipment would have on the local health care workforce as the case numbers in the Washington, D.C., metro area grew, as well as in hard hit places such as New York.

"Heavy industry is producing more, but help is likely months away," Rao said.

They knew equipment would be needed now, so the couple joined with Murray Loew, PhD, chair of the GW Department of Biomedical Engineering, and Jeffrey Berger, MD, MBA, chair of the Department of Anesthesiology and Critical Care Medicine at SMHS, to create 3D printed respirators.

"These respirators still need a filter, and we are relying on MERV 13 and MERV 16 filters from HVAC units," Rao explained. "We have tested some preliminary designs and were even able to get one of the designs to pass a Bitrix fit test, which is a mask fitting test for N95 masks that they perform at GW Hospital."

In addition to Rao and Provenzano, the masks were created with the help of PhD student Sofian Obaid, GW graduate teaching assistant Konstantin Mitic, the Corocan School of Arts and Design, the GW Library, GW Hospital Employee Health, and the many physicians who assisted with preliminary fit-tests of the masks.

Rao noted that the mask is not the perfect solution, it's rigid and currently can only be fitted using tape or foam. But he and Provenzano are hard at work trying to find solutions to those problems, such as making several different sizes of masks to fit more people.

"Right now, using GW's resources, we might be able to produce up to 100 masks per day," Rao said. "The masks are reusable and can be sterilized. This has the potential to make a big impact and protect many people. Doctors from other institutions around the country are interested in our work and are following closely."

However, Rao emphasizes that these masks are only a backup to the preferred N95 mask.

But as cases in the D.C. area and around the country grow, innovative solutions will become all the more important, with experts like Rao and Provenzano leading the way in efforts to help keep patients and health care workers as safe as possible.

"Both Destie and I feel that we are lucky that we can use our engineering and medical knowledge to help to the best of our ability," Rao said. "Everybody, including us, is working overtime to prepare as much as we can. The pandemic is a once in a lifetime event, and is a unique chance to use our education and skills to help out. We can't wait for the day when things go back to normal at GW and in D.C., but we recognize that it may be several months away and there is so much work to do to get to that point."

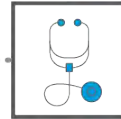
PATIENT EXPERIENCE SURVEY

Over the course of four months, we asked patients to rate their satisfaction with our providers, staff, and quality of care. The survey was administered after the patient's final radiation treatment. Responses were collected in a secure box to maintain patient confidentiality. All responses were input into a database and below is a summary of the findings.



"Would recommend GW Rad Onc to family and friends"

94.5%



95.3% of patients were very satisfied with the level of care received by providers and staff.



When asked, "How attentive, caring, and understanding do you feel our providers and staff are?" 96.1% selected "Very attentive."



When asked, "How thorough do you feel providers and staff explanations and instructions for care are?" 88.2% said "Very thorough."

SELECTED PATIENT COMMENTS:

What do you like best about our practice?

"The attention I got from doctor and staff. I could understand freely the process of my care."

"The staff handling treatment time management, courteseness, and everything."

"Ms. April, Ms. Judy, and the staff that provided daily treatment are patient-oriented and very professional."

"Respect and flexibility - I had to come in everyday for 8 weeks. The staff bent over backwards to treat me, no matter when I came."

What are we doing especially well?

"Checking in with patient regularly and being available and approachable at all times."

"Radiation is necessary, but dehumanizing. The staff are wonderful about making this necessary and much more pleasant."

What can we do to improve?

"Three times I missed my treatment because the machine was broken."

"I think the process should be explained better to the patient, so it is clear what procedure is being done and overall process."

Below is a patient note from their last day of radiation treatment in April, 2020.

"Being diagnosed with cancer is a true life trial. The GW teams, however, have helped me to be a better-informed, confident patient ... Tomorrow I will wake up, think about the Radiation team, smile, turn over, and sleep a little longer, knowing GW is God's blessings of me."

A heart-shaped medical syringe is the central focus, with a stethoscope visible in the background. The entire image has a blue tint and is framed by a thick blue border.

GIVE THE GIFT OF HOPE

At GWRadiation Oncology, we are committed to providing our patients the most advanced treatments and highest level of compassionate care available. Using state-of-the-art technologies, our oncologists deliver targeted treatment that's personalized to the individual, not just the disease. We're dedicated to the practice of evidence-based medicine and are continually discovering new and better treatment options to improve patient outcomes.

Day after day we receive notes from patients who are grateful for the care they received at GW. Will you help ensure the same life-saving care and innovative research is available for future patients?

We are continuously striving towards better cancer care - with your gift you can help us get there.

To support our mission, visit go.gwu.edu/GiveRadOnc

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