UT Southwestern
Harold C. Simmons
Comprehensive Cancer Center

THE TARGET

DEPARTMENT OF RADIATION ONCOLOGY

VOL 8
SUMMER 2022

Message from the Chair

More than two years ago, we shifted our focus to PULSAR™-style treatments of personalized, unique therapy for each of our patients. With this advancement has come an expanded building filled with a number of state-of-the-art, unmatched adaptive treatment machines.

As we continue to push toward this goal, we have much in place – but more is required. We need to study the individual patient's biology, including the treated tumor's reaction to prior therapies, all to determine if the treatment is performing adequately. Tumors constantly evolve, and that evolution creates opportunities for cancer to elude the ongoing therapy. We must have a treatment to uniquely fit the particular patient's situation.

In this issue of *The Target*, you will read about a new paradigm for treating pediatric cancer patients without the use of anesthesia, as well as the first randomized study of adaptive radiation therapy in head and neck cancer implementing the smallest head and neck irradiated volumes ever delivered and analyzed.

You will also read about our collaboration with the Department of Cardiology, where we are providing an alternative form of treatment for patients with ventricular tachycardia – combined standard cardiac ablation with radiation therapy.

We continue to pioneer novel approaches with clinical trials that tackle some of the most important issues in cancer treatment, including an investigation of novel drug use to treat one of the most pervasive and threatening cancer symptoms. Furthermore, new molecular biology research from our team uncovers details regarding our body's ability to repair DNA, with exciting implications for the future.

I hope as you read through this publication, our department's focused investment in advancing patient care remains apparent. Many places across the world look to us for what is next in the field of radiation oncology. We want to continue to be at the forefront of advancing this ever-changing field.

– Robert Timmerman, M.D., FASTRO, FACR

Professor and Chair, Department of Radiation Oncology
Effie Marie Cain Distinguished Chair in Cancer Therapy Research

A pediatric patient being treated on the PROMISE protocol watches a movie while receiving treatment.

The **PROMISE** of a Better Pediatric Radiation Experience

Featured Story
By Sepeadeh Radpour

Treating the pediatric radiation oncology population has historically been difficult. Because it is imperative to have patients stay still during radiation treatment, general anesthesia is commonly used to facilitate radiation treatments in children, with most children age 7 and under receiving general anesthesia. This can cause many complications, difficulties, and detriments to the quality of life for patients because the regular course of radiation typically involves four to six weeks of daily treatment. Some of these setbacks include not being able to eat before treatments, a substantial increase in treatment time and recovery, potential health effects such as neurocognitive impairments from repeated doses of anesthesia, allergic reactions, more pronounced anxiety and fear, vascular access device complications, and a significant rise in financial burden. The stress that these patients and their families endure is tremendous and is amplified by the daily anesthesia – school schedules are severely disrupted, moods worsen because they cannot eat, and medical costs are high.

The use of anesthesia in the pediatric population puts stress on the hospital system logistically and financially as well. Prolonging treatment time for children from 30-45 minutes to three or four hours because of the need for anesthesia, which requires increased staff,

Vision RT motion monitoring system

decreases clinical efficiency significantly. To combat these issues, using pictures or videos to assist in relaxing pediatric patients is a technique in the field that has been successful but not to the extent of its integration with other systems to provide enhanced safety and behavioral training for children.

Kiran Kumar, M.D., M.B.A., Assistant Professor of Radiation Oncology and Chief of Lymphoma and Pediatric Radiation Oncology Services, along with physicists Steve Jiang, Ph.D., and Tsuicheng David Chiu, Ph.D., in the Department of Radiation Oncology, have pioneered an exciting new technology; as a result of initial early success, they launched a clinical trial in February 2022 called PROMISE (Pediatric Radiation Oncology with Movie Induced Sedation Effect).

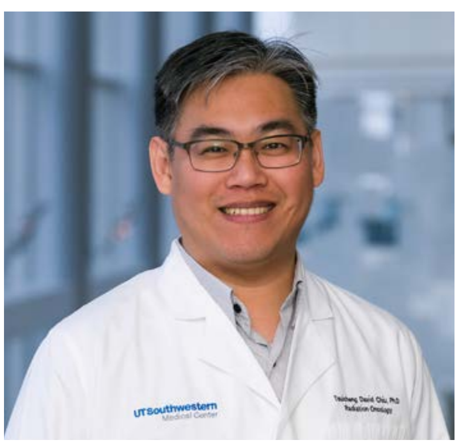
In this new model, an interactive incentive-based movie system is integrated with Vision RT, a commercial video surveillance gating module to be used in lieu of sedation. Patients being treated on the PROMISE protocol choose a movie to watch for the duration of their radiation treatment. Once radiation starts, the video will play and the system will provide real-time motion monitoring of the patient, automatically shutting off the radiation beam and movie if there is excessive movement. Once the patient is back in the correct position, the movie and the radiation beam will continue. Consequently, this system provides a one-of-a-kind, built-in safety mechanism as well as real-time behavioral training that uses mostly positive reinforcement for pediatric patients.

This method has minimal risk and is targeted for children ages 3 to 11 with the goal of decreasing the percentage of patients who require general anesthesia in the 3 to 7 age group from 70% to 30%. Dr. Kumar and his team have great hopes for the outcomes of this trial.

“Our vision as a team is to reach a point where the large majority of kids ages 3 or older are able to get radiation treatment without needing anesthesia every day,” Dr. Kumar says. “This will significantly improve their quality of life and their happiness, especially when they’re already going through cancer and coming in every day for radiation treatment. If there is any small thing we can do to improve their quality of life, we think it’s a pretty big deal. We believe that PROMISE is something that could be done across the world and could be a game changer for all kids who need radiation.”

Kiran Kumar, M.D., M.B.A.

Steve Jiang, Ph.D.



Tsuicheng David Chiu, Ph.D.

Bradley Metcalf and his daughters, Lena (left) and Xuma

Patient Spotlight: **Bradley's Story**

By Ryan Daugherty

Bradley Metcalf, 67, has lived in Dallas for more than 43 years. Originally from Kentucky, he decided to move to the Metroplex after earning his bachelor's degree in science. He has two daughters, Lena and Xuma, and works as a freelance special effects artist for food commercials.

In December 2021, Mr. Metcalf noticed a lump on his neck. He thought it was the result of something he had done days prior and decided to wait to see if it would disappear. The lump wasn't painful, and he even forgot about it. However, once January came around and it remained the same size, he knew it was a serious issue that needed to be addressed.

He visited his general practitioner who performed a biopsy. It was revealed that he had an HPV-associated oropharyngeal cancer with a tumor in his tongue and a couple more in his neck. Based on those results, he was referred to UT Southwestern. He was also told about a recently activated head and neck clinical trial in the Department of Radiation Oncology led by David Sher, M.D., M.P.H.

"I had heard great things about the department and the technology they had," Mr. Metcalf says. "I actually had a friend who was treated by Dr. Sher, so I knew about him and how confident he was, and that made me feel good as well."

Dr. Sher, Professor of Radiation Oncology, is Chief of Head and Neck Radiation Oncology Services at UT Southwestern as well as Associate Vice Chair for Clinical Operations. Treating head and neck cancer has been a strong focus of his since the beginning of his career.

Dr. Sher has extensive experience in the formal teaching of residents, fellows, and post-docs, and he has authored numerous papers advancing the field of radiation oncology. Additionally, he is the principal investigator of multiple clinical trials, including a recently opened phase two trial called DARTBOARD.

DARTBOARD, officially known as Daily Adaptive Radiotherapy to Better Organ-at-Risk Doses in Head and Neck Cancer, is the first randomized study of adaptive radiation therapy – delivering radiation to an increasingly smaller area of tissue based on a patient's real-time anatomy – in head and neck cancer. UT Southwestern is the only site for the study and will implement the smallest head and neck irradiated volumes ever delivered and analyzed.

The primary goal of DARTBOARD is to determine whether daily adaptive radiation therapy can reduce dry mouth after treatment compared with traditional radiation therapy. It is a randomized study with half of patients receiving focused nodal therapy without adaptation and half receiving focused nodal therapy with daily adaptation. Because each individual fraction is personalized to that day's anatomy, the "safety margins" for daily setup error are drastically reduced on the adaptive arm, minimizing the amount of normal tissue irradiated.

"The biggest challenge in our field is figuring out how to obtain a superb cancer outcome while improving short- and long-term quality of life, which includes saliva and taste, normal swallowing, skin thickening, and even appearance or voice," says Dr. Sher. "Our goals are to maximize the oncologic success rate as well as to improve quality of life, and we have chosen to do that using the Ethos technology."

With Ethos, the contouring and replanning time takes only approximately 15 to 20 minutes instead of hours or even days. This includes taking the patient's mini scan, recontouring the targets and normal tissues, and quality-checking the final product.

Mr. Metcalf was the first patient to be treated adaptively on the DARTBOARD trial and received 35 treatments over seven weeks. He notes that from a patient standpoint the treatments have run very smoothly, and he commends the staff supporting him and making his daily visits as stress-free as possible. As someone with an interest in machines, he has even been able to talk with a few of the radiation therapists about how the machines' beams are created and how the motors move them around. These daily conversations not only alleviate any stress but also build and strengthen the trust between him and his treatment team.

For the most part, side effects of the treatment have been minimal. He has lost most of his sense of taste, and shopping for the right foods has become a challenging task. However, there has been little fatigue and he hasn't had any skin reactions. All in all, he has done extremely well. In fact, by the second week of treatment, his tumor had significantly decreased in size.

"He has exceeded my expectations in sort of every domain of treatment tolerance," Dr. Sher says. "I try to explain to him that this is not how people usually do. I have the confidence of seeing his anatomy and optimizing his plan every day of treatment; it's actually very powerful."

While the primary goal of DARTBOARD is to improve dry mouth and quality of life after head and neck cancer treatments, the hope is that this approach, along with the artificial intelligence-driven process, could become the first steps toward providing daily adaptive radiation therapy for other types of cancer, with even more precision and personalization.

"They are a wonderful department," Mr. Metcalf says. "For what I'm going through they make it very easy – from checking in to the short proximity of the treatment room and sending me texts and emails to make sure I know what is going on. And the staff who are very knowledgeable and accommodating. It's been a great experience."

Bradley Metcalf talks with Dr. Sher during a visit.

Featured Clinical Trial: Incyte

By Sepeadeh Radpour

STU2021-0475: Pilot Study of Ruxolitinib in the Treatment of Cancer Cachexia; short title: JAK Inhibitor for Cancer Cachexia

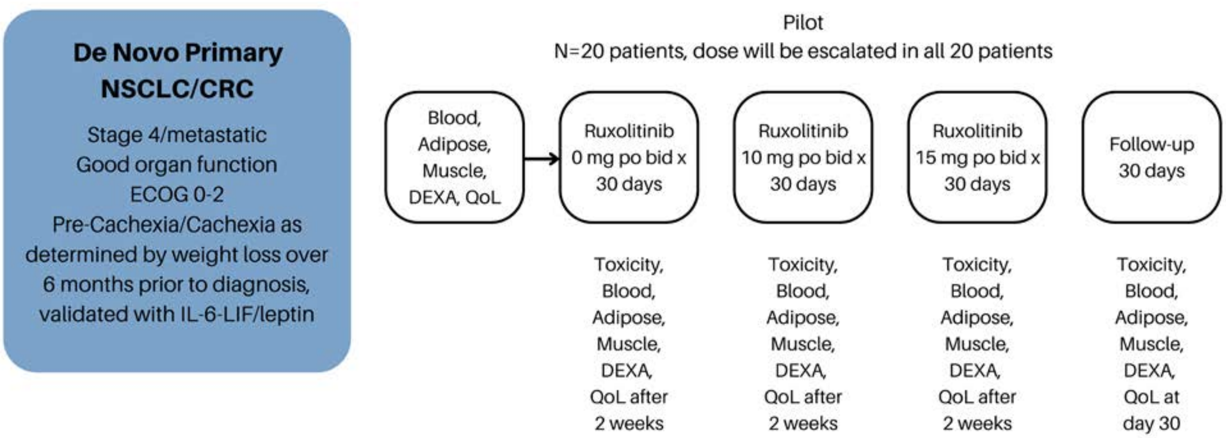
- **Condition:** De novo stage 4 primary non-small cell lung cancer (NSCLC) with adequate end-organ function, ECOG score of 0 to 2, and evidence of pre-cachexia or cachexia

- **Treatment:** Two months of dose escalation with ruxolitinib (Jakafi), a Janus kinase inhibitor (JAK); pilot study will consist of one arm with 20 patients

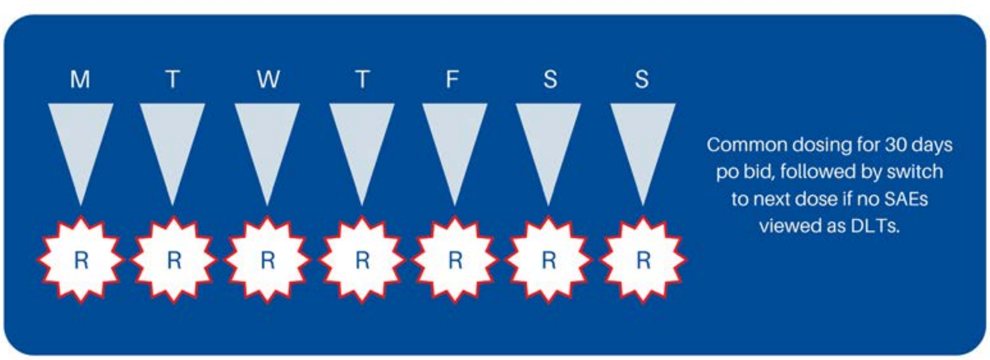
    - Patients will be evaluated using QOL measures, DEXA scans, blood, and optional biopsies every two weeks. The patient will move on to the next dose as long as there are no dose-limiting toxicities (DLTs).

        - Dose 0, month 1 - following of patient while receiving standard of care (SOC)
        - Dose 1, month 2 - 10 mg ruxolitinib taken by mouth twice a day
        - Dose 2, month 3 - 15 mg ruxolitinib taken by mouth twice a day
        - Month 4 - patient follow-up while receiving SOC

- **Potential Benefit:** Improved patient quality of life, particularly in terms of delaying or reversal of cancer cachexia development and overall improvement in survival outcomes



Dosing Regimen for Ruxolitinib



A new Incyte pilot study seeks to address cachexia, a significant side effect in all cancer patients, particularly lung cancer patients. Cachexia, also known as wasting syndrome, is observed in about half of all cancer patients and is responsible for 30% of all cancer-related deaths. It is characterized by severe weight loss, including the loss of body fat and muscle.

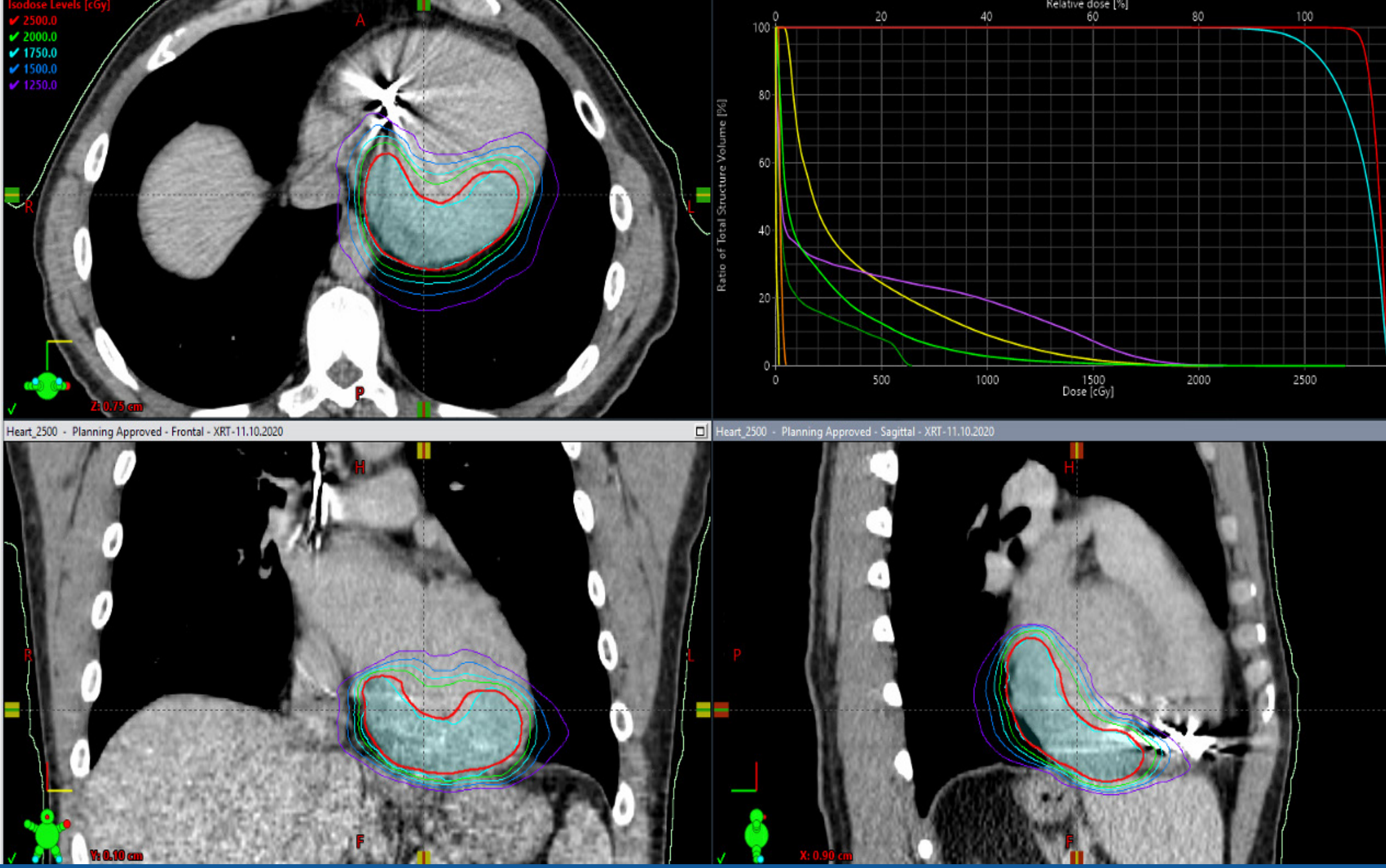
This trial will investigate the use of ruxolitinib (Jakafi), a Janus kinase inhibitor (JAK). JAK inhibitors impede the JAK-STAT signaling pathway and have been associated with weight gain and inflammation suppression. As a result, this trial has been launched with the hopes of ultimately improving patient survival and quality of life by developing a treatment for cancer cachexia. The study is currently seeking eligible patients, with the goal of recruiting two to three patients per month.

Puneeth Iyengar, M.D., Ph.D., Associate Professor of Radiation Oncology, Medical Director, and Chief of Lung Radiation Oncology Service, is the trailblazer for this clinical trial and believes that this project has the potential to ameliorate this profound medical problem. He has run a research program in his laboratory for years that has focused on the mechanisms of cancer cachexia development and potential ways to control it. Several of his lab's publications led the way to the idea that cachexia can be suppressed by JAK inhibitors, which was further corroborated by animal model studies.

"You can treat the tumor but still succumb to cachexia, which is why it is such an important clinical problem," Dr. Iyengar says. "If you have two patients with the same stage and type of cancer but only one has cachexia, the patient with cachexia will live half as long because having wasting syndrome cuts survival in half. We proposed this early phase clinical trial to see if the drug can be tolerated by cancer cachexia patients and whether it will have an impact in potentially reversing the cachexia wasting process."

If this trial is successful, clinical implications will be vast because cachexia affects many noncancer disease patients as well. As there is currently no treatment for cachexia, there are high hopes for this trial because it has the potential to ultimately make a colossal difference in patient outcomes and quality of life.

Puneeth Iyengar, M.D., Ph.D.



The precision of cardiac radioablation makes it possible to target the abnormal areas of the heart while avoiding normal heart tissue.

A New Hope for High-Risk Heart Patients

By Ryan Daugherty

After a heart attack or congestive heart failure, a section of the heart's muscle may be replaced by scar tissue, preventing the wall from pumping blood. For some patients this scar may include residual muscle fiber and, while unable to contract, can still slowly conduct electricity. An electrical stimulus can start for each beat normally, but once the stimulus reaches the scar, the electrical impulse in that location slows down. The normal impulse travels around the normal scar for the normal beat but the stimulus within the scar travels more slowly through the scar and eventually reenters the heart causing an extra beat. When this pattern happens continuously, it causes the heart rate to increase significantly. This is called ventricular tachycardia.

Most patients with ventricular tachycardia have previously undergone implantation of a defibrillator to monitor their heart rhythm and deliver a lifesaving "shock" when ventricular tachycardia is detected. The defibrillator can be interrogated by cardiologists during visits to check on the progression or regression of the detected rhythms.

To treat ventricular tachycardia, cardiologists often perform a procedure called cardiac ablation (also known as atrial fibrillation ablation), in which catheters and applied heat are placed to "finish off" the scar.

James Daniels, M.D., Associate Professor of Medicine-Cardiology, and Richard Wu, M.D., Professor of Medicine-Cardiology, are cardiac electrophysiologists who specialize in treating cardiac arrhythmias at UT Southwestern.

Dr. Daniels and Dr. Wu have collaborated with Robert Timmerman, M.D., FASTRO, FACR, Professor and Chair of Radiation Oncology, and a team of radiation oncology medical physicists to provide an alternative form of treatment for patients – combined standard cardiac ablation with radiation therapy. UT Southwestern is the only center in North Texas performing this procedure.

The UT Southwestern cardiac radioablation team

"It's very awkward for a radiation oncologist to purposefully hit the heart, but that is exactly what we are doing here," Dr. Timmerman says. "This is an everyday thing for cardiologists, so this collaboration has been unique in that they have made us more comfortable with a treatment that otherwise would be against our culture."

In traditional cases, cardiologists use electrocardiograms to map out where reentry pathways are located in the heart followed by functional imaging to locate a scar corresponding with the originating arrhythmia.
A coordinate system is used to determine how catheters will be brought in. Radiation oncologists treat tumors with CT scans or an MRI from the patient's feet to their head slice by slice.

In order to determine the best way to fuse both of these systems together, medical physicist Weiguo Lu, Ph.D., Associate Professor of Radiation Oncology, created image fusion software allowing both electrophysiology cardiologists and radiation oncologists to locate and ablate the scar tissue target precisely.

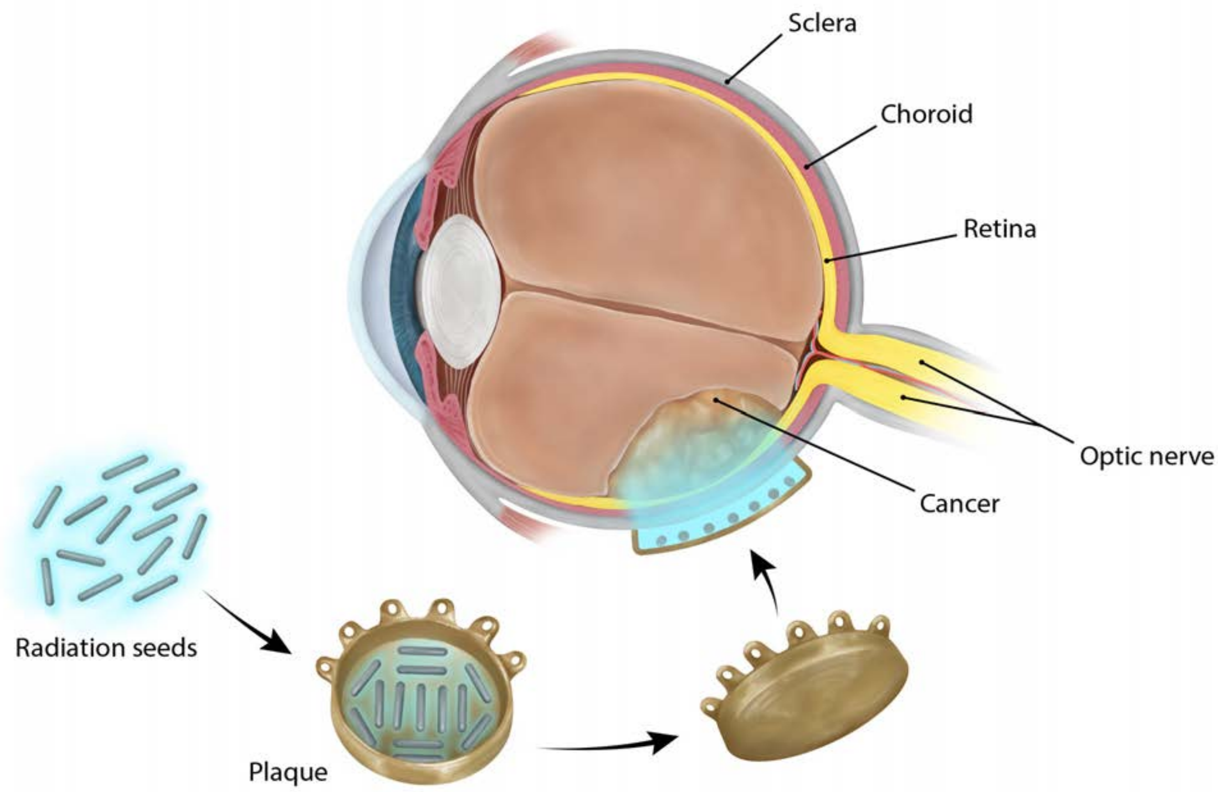
While preparation and planning take considerable time, cardiac ablation with focused stereotactic radiation takes only around 20 minutes to complete. Patients go home the same day as they get treated, and a trip to the ICU is not needed. The defibrillators are also left in place, allowing time for the treatment to work, which usually takes a few days to weeks. Early on, treated patients at UT Southwestern have enjoyed a dramatic reduction in their ventricular tachycardia events.

"In the studies that have been done, the burden of arrythmia seems to decrease pretty quickly within the first few weeks," Dr. Daniels says. "Our first patient had several episodes of this particular arrhythmia in the six weeks leading up to treatment; six weeks after treatment, he had no more arrhythmias, so it does appear that he has gotten significant benefit with radiation."

Moving forward, a clinical trial for this procedure is being discussed, revolving around the safest way to deliver this treatment, determining the best dose of radiation to give to patients, and how much of the heart can be given radiation. There are plans to be part of multicenter studies as well.

In the meantime, there is excitement at UT Southwestern with how the collaboration has progressed in its early stages.

"We are still investigating and learning, but it all looks very promising based on what we've seen so far as well as reports from other centers," says Dr. Wu. "It isn't a primary option for patients, but it is an alternative, and we're confident this is going to be a real benefit for those with no other options."



Eye Preservation with Eye Plaque Brachytherapy

By Ryan Daugherty

Uveal (intraocular) melanoma is a rare cancer accounting for nearly 3,000 cases a year in the U.S. Traditionally, treatment has involved the complete removal of the eye. At UT Southwestern Medical Center, a procedure involving eye radiation therapy called eye plaque brachytherapy is offered. This procedure allows for preservation of the eye and yields equivalent results to surgery, with more than 90% of patients keeping their eye.

This program is a collaboration between the Departments of Ophthalmology and Radiation Oncology and is led by J. William Harbour, M.D., Professor and Chair of Ophthalmology. Specializing in ocular oncology, Dr. Harbour's clinical interests focus on ocular tumors such as uveal melanoma, retinoblastoma, and lymphoma. He has trained many residents and fellows, pioneered new surgical methods in brachytherapy for ocular tumors, and has been awarded patents for innovations in genetic prognostic testing for uveal melanoma.

Dr. Harbour previously directed the ocular oncology program at Bascom Palmer Eye Institute of the University of Miami School of Medicine, one of the top centers in the world for the treatment of uveal melanoma. His goal is to make UT Southwestern a major referral center for this treatment.

"The latest evolution in plaque brachytherapy technology is to use 3D computer simulation to optimize radiation dose shaping," Dr. Harbour says. "With this technology, we are not only saving more eyes but also improving visual outcomes in those patients."

In the eye plaque brachytherapy procedure, a bottle cap-like gold plaque is attached to the eye. Inside the plaque are rice grain-sized radioactive seeds. The radioactive eye plaque is sutured to the patient's eye, and radiation is continuously emitted at a low dose into the tumor. Because of the gold plaque shield, no radiation goes behind or to the side of the plaque, eliminating damage to the other eye or the brain.

Within the Department of Radiation Oncology, Assistant Professor Dat Vo, M.D., Ph.D., a radiation oncologist specializing in central nervous system cancer, and Associate Professor Brian Hrycushko, Ph.D., a medical physicist specializing in brachytherapy, play a vital role in the program.

After an initial diagnosis and measurements of the tumor are made, an MRI and ultrasound are sent to Dr. Hrycushko, who creates several treatment plans to determine how big the plaque will be and how many seeds need to be included. Based on these plans, Drs. Vo and Harbour discuss what adjustments need to be made in terms of dose to the optic nerve versus making sure a certain minimum dose can get to the tumor.

Quality control is performed on these plaques, which are made off-site, by both Drs. Vo and Hrycushko to ensure the parameters that were ordered are met. During the actual procedure, Dr. Vo is present in the operating room to perform quality control on the plaque and to check the plaque placement on the ultrasound once it is placed by Dr. Harbour. The procedure takes around 45 minutes, and the patient leaves the same day. The plaque remains in place for three to four days, after which it is removed in a brief second procedure. Drs. Vo and Hrycushko help Dr. Harbour ensure the treatment goes well and there are no issues with the plaque and seeds.

According to Dr. Vo, there are ongoing research efforts to further improve the treatments with the use of genetic testing. He also mentions researching the inclusion of adaptive radiotherapy, a new therapy in the Department of Radiation Oncology that combines real-time, high-resolution imaging and modern radiation techniques to deliver ultra-precise treatment that can be quickly adapted to changes in patients' anatomy and tumor size.

The program's first patient has done extremely well and is expected to retain normal vision, but Dr. Harbour wants to continue pushing forward. As procedures are being performed, he is collecting tissue samples and running genetic tests to study differences in how people respond to treatment and which patients benefit from an escalation or de-escalation in treatment.

A big attraction for Dr. Harbour joining UT Southwestern was to start a program like this with the Department of Radiation Oncology, which has a great reputation as one of the top departments in the country. He aims to work with his Radiation Oncology colleagues to develop new innovations that propel this therapy to new levels of success.

"This collaboration is really a product of that," he says. "With the clinical and research excellence between us, we will continue to improve this treatment and program — working together."

J. William Harbour, M.D.

Dat Vo, M.D., Ph.D.

Brian Hrycushko, Ph.D.

Basic Research:

How Can You **Mend a Broken Strand?** Investigating the Intricacies of DNA Repair

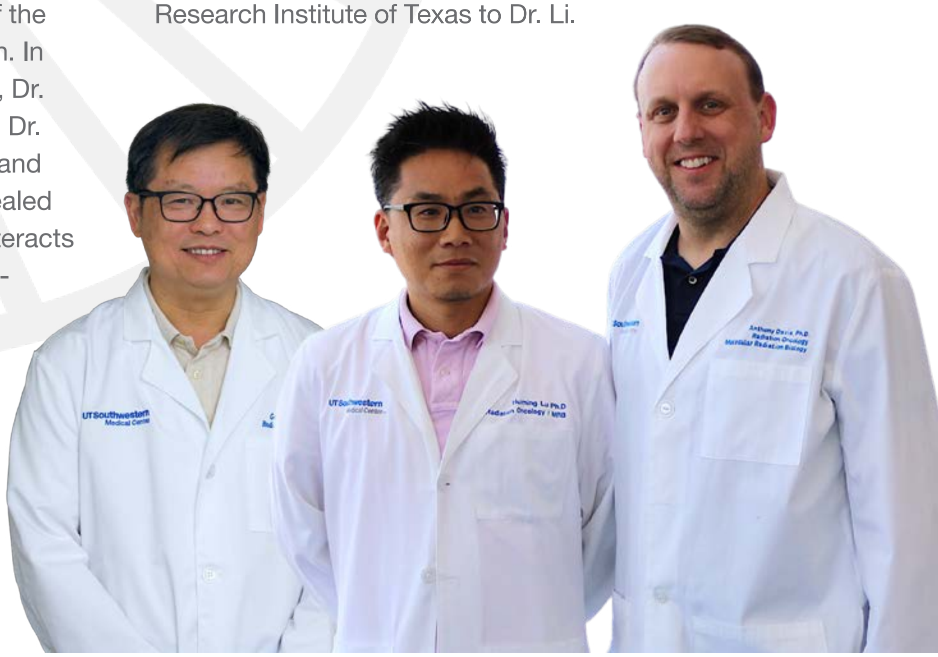
By Sepeadeh Radpour

DNA double-strand breaks (DSBs) are deleterious DNA lesions that if left unrepaired or are misrepaired can result in chromosomal aberrations, known drivers of carcinogenesis. Pathways that direct the repair of DSBs are traditionally believed to be guardians of the genome as they protect cells from genomic instability. The prominent DSB repair pathway in human cells is the non-homologous end joining (NHEJ) pathway, which mediates re-ligation of the broken DNA molecule. Furthermore, defects in NHEJ lead to enhanced sensitivity to agents that induce DSBs and an increased frequency of chromosomal aberrations. NHEJ initiates when the DNA-PK complex, composed of the Ku heterodimer and DNA-PKcs, detects and binds to the ends of the DSB. Subsequently, the DNA-PK complex recruits the NHEJ machinery to the DSB in order to direct repair of the damaged DNA. Although much is known about NHEJ, a key unanswered question is: "What factors promote stabilization of the NHEJ machinery at DSBs?"

Recent published work from the lab of Anthony J. Davis, Ph.D., Assistant Professor of Radiation Oncology, has uncovered important details regarding the role of the DNA helicase RECQL4 in answering this question. In their paper, published in *Nucleic Acids Research*, Dr. Davis and his team, working in collaboration with Dr. Guo-Min Li (Department of Radiation Oncology) and Dr. Vilhelm Bohr (National Institute of Aging), revealed that RECQL4 is quickly recruited to DSBs and interacts with DNA-PKcs where it helps facilitate DNA end-tethering by the DNA-PK complex. This DNA tethering facilitates assembly of the NHEJ components at DSBs. It was also found that DNA-PKcs phosphorylates RECQL4 following DNA damage, which is important for RECQL4 recruiting and accumulation at DSB sites. This reciprocal regulation between DNA-PKcs and RECQL4 ultimately promotes repair of DSBs by NHEJ.

"Previous work found that RECQL4 promotes NHEJ, but its exact role in this repair pathway was unknown. Our study shows that RECQL4 plays a scaffolding role in stabilizing the NHEJ machinery at DSBs," Dr. Davis says. "Previously, we identified that RECQL4 phosphorylation by cell cycle-dependent kinases influences the DSB repair pathway homologous recombination, and here we found that RECQL4 phosphorylation by DNA-PKcs promotes NHEJ. Together, these studies suggest that phosphorylation of RECQL4 is a way for a cell to select different DSB repair pathways," notes lead author Huiming Lu, Ph.D., Instructor in the Davis Lab. "RECQL4 mutations are associated with autosomal disorders that cause premature aging as well as cancer susceptibility. We plan to examine how modulating RECQL4 influences both phenotypes," adds Dr. Davis.

This work is mainly supported by funds from the NIH to Dr. Davis, and partially by the Initiative Seed Fund for Career Development from the Department of Radiation Oncology to Dr. Lu, and the Cancer Prevention and Research Institute of Texas to Dr. Li.



Guo-Min Li, Ph.D.; Huiming Lu, Ph.D.; Anthony Davis, Ph.D.

Bringing **Brachytherapy** to Lagos, Nigeria

By Mary Whitmore

Late last summer, Chika Nwachukwu, M.D., Ph.D., Assistant Professor of Radiation Oncology and part of both our breast and gynecologic cancer teams, took a week-long trip to NSIA-LUTH Cancer Centre (NLCC), in Lagos, Nigeria, to help radiation oncologists there establish an official brachytherapy program, which is now the first of its kind in that part of the world.

NLCC, part of Lagos University Teaching Hospital, is situated in the western part of Nigeria and is the second most populous city in Africa. Specialists at the facility, which opened in May 2019, had experience with external beam radiation therapy, such as IMRT, but wanted to advance their practice with brachytherapy — a very technical and highly effective procedure for certain cancer patients.

Just prior to Dr. Nwachukwu's arrival, the clinic acquired a Varian GammaMed afterloader, a device that stores the radiation source. NLCC's team, which includes physicians, physicists, therapists, and nurses, needed to gain a comprehensive understanding of the brachytherapy process. Overall, their goals were to learn how to use the afterloader; effectively perform brachytherapy on their cervical cancer patients; and learn treatment planning, contouring, and delivery.

Throughout the week, Dr. Nwachukwu led them through each step of the process, which entailed ensuring patient selection for brachytherapy, performance of the procedure including appropriate set up of materials, moderate sedation techniques, actual implant insertion using ultrasound guidance, contouring and treatment planning, delivery and device removal, and safe discharge of the patients.

For guidance with treatment planning, they worked with UT Southwestern colleague Brian Hrycushko, Ph.D., who participated in Zoom calls to guide the physicists through practical aspects of planning.

The NLCC team sent Dr. Nwachukwu their first solo case after her return to the U.S., and she was very impressed with their work.

"It is the same motto of *see one, teach one, do one* — so we spent the time really teaching the staff so that they could be equipped to treat their patient population," Dr. Nwachukwu says. "And a paper on their experience is in the works!"

+ Education **Highlights**

Biomedical Engineering Graduate Program – Medical Physics Track

The Medical Physics Track of the Biomedical Engineering Graduate program, led by You Zhang, Ph.D., Assistant Professor in the Division of Medical Physics and Engineering, received accreditation from the Commission on Accreditation of Medical Physics Education Programs (CAMPEP). This recognition means that our program has met CAMPEP requirements, which is a huge accomplishment as it allows our students to pursue careers in clinical medical physics. Students who have graduated from the medical physics track are now eligible for subsequent medical physics residency training and board certification by the American Board of Radiology.

Precision Radiation Oncology Fellowship (PROF)

The Precision Radiation Oncology Fellowship (PROF) is a one-year training program that focuses on the application of technologies that provide highly customized treatments for patients, including adaptive radiotherapy accelerators that can optimize the daily treatment based on an individual's anatomy on a particular day. The fellowship curriculum addresses candidates' varying needs and interests in clinical experience, process implementation, and research.

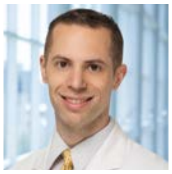
Newly Appointed Associate Residency Directors

Chika Nwachukwu, M.D., Ph.D., Assistant Professor, was appointed Associate Director of our Medical Residency Program. Dr. Nwachukwu received her Ph.D. from the University of Chicago and her medical degree from Mayo Medical School. Her research interests are in gynecologic malignancies, women's health, and global oncology initiatives. Dr. Nwachukwu, part of both our breast and gynecologic cancer teams, joined the UT Southwestern faculty in September 2019.

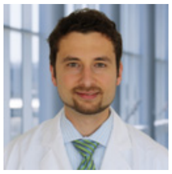
David Parsons, Ph.D., Assistant Professor, was appointed Associate Director of our Medical Physics Residency Program. Dr. Parsons, a former physics resident in our department, joined the UT Southwestern faculty in July 2020. He was 2022's Medical Physics Faculty of the Year.

Medical Resident Graduates

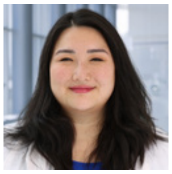
Mark McLaughlin, M.D., Ph.D.
Medical School: Baylor College of Medicine
Practicing: The Oklahoma Proton Center



Howard Morgan, M.D.
Medical School: Louisiana State University School of Medicine
Practicing: Central Arkansas Radiation Therapy Institute

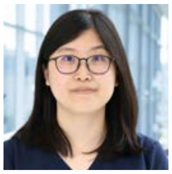


Samer Salamekh, M.D.
Medical School: Ohio State University College of Medicine
Practicing: Baptist Medical Center Beaches



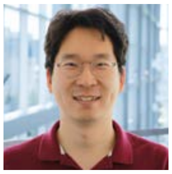
Elizabeth Ren Zhang-Velten, M.D., Ph.D.
Medical School: UT Southwestern Medical School
Practicing: Kaiser Permanente Ontario

Physics Resident Graduates



Liyuan Chen, Ph.D.
Ph.D.: Hong Kong Baptist University
Practicing: UT Southwestern Medical Center

Samaneh Kazemifar, Ph.D.
Ph.D.: University of Western Ontario
Practicing: Texas Oncology



Heui (Hugh) Lee, Ph.D.
Ph.D.: Purdue University
Practicing: Washington University

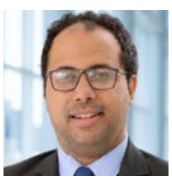
Xinran Zhong, Ph.D.
Ph.D.: UCLA
Practicing: UT Southwestern Medical Center

Incoming Medical Fellow

Dana Keilty, M.D.
Undergraduate Education: Bachelor of Health Sciences (Honours), McMaster University
Graduate School: Masters of Science in Experimental Medicine, McGill University
Medical School: McGill University

Incoming Medical Residents

Ryan Assadi, D.O.
Undergraduate Education: Towson University
Graduate School: Johns Hopkins University
Doctor of Osteopathic Medicine: Edward Via College of Osteopathic Medicine



Ahmed Elamir, M.D.
Undergraduate Education, Graduate School, & Medical School: University of Cairo, Egypt

Meng-Lun Hsieh, Ph.D., D.O.
Undergraduate Education: Williams College
Graduate School: Michigan State University
Doctor of Osteopathic Medicine: Michigan State University College of Osteopathic Medicine

Young Suk (Joseph) Kwon, M.D.
Undergraduate Education: Duke University
Graduate School: Rutgers University
Medical School: Mercer University School of Medicine

Incoming Physics Residents

Sean Domal, Ph.D.
Undergraduate Education: University of Kentucky
Graduate School: University of Florida
Ph.D.: University of Florida

Ruiqi Li, Ph.D.
Undergraduate Education: Shandong University
Graduate School: Duke University
Ph.D.: UT Health Science Center at San Antonio

Mahbubur (Ronny) Rahman, Ph.D.
Undergraduate Education: New York University
Graduate School: Duke University
Ph.D.: Dartmouth College

Siqiu Wang, Ph.D.
Undergraduate Education: UT Austin
Graduate School: UT Austin
Ph.D.: Virginia Commonwealth University

Residency Awards

Howard Morgan, M.D., was awarded the David Pistenmaa Award, which is given to a graduating resident who best exemplifies the conduct of Dr. Pistenmaa – displaying courtesy and respect to all members of the clinical care staff at UTSW.

Liyuan Chen, Ph.D., was named the 2022 Physics Resident of the Year. This award recognizes a medical physics resident who demonstrates authentic leadership; strives to provide exemplary service to the department, its mission, and ultimately, the patients we serve; and has an undeniable commitment to the residency program.

Elizabeth Ren Zhang-Velten, M.D., Ph.D., received an ASTRO research award, which is given to the highest scoring resident-submitted abstract. The award was for her research in Dr. Prasanna Alluri's lab on early noninvasive detection of radiation-induced heart disease. She and her team found in their preclinical model that radiation caused shifts in heart cell metabolism that can be picked up by a specialized dye on MRI.

+ OUR CLINICAL FACULTY

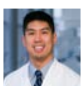

Todd Aguilera, M.D., Ph.D.
Assistant Professor


Kevin Albuquerque, M.D., FACR
Professor and Director of Radiation Oncology Accreditation
Chief of Gynecological Radiation Oncology Service
Holder of the Ken Sharma Professorship in Radiation Oncology


Prasanna Alluri, M.D., Ph.D.
Assistant Professor


Mona Arbab, M.D., M.Ed.
Assistant Professor


Vladimir Avkshtol, M.D.
Assistant Professor


Tu Dan, M.D.
Assistant Professor


Neil Desai, M.D., M.H.S.
Associate Professor
Dedman Family Scholar in Clinical Care


Aurelie Garant, M.D.
Assistant Professor


Raquibul Hannan, M.D., Ph.D.
Associate Professor
Chief of Genitourinary Radiation Oncology Service


Puneeth Iyengar, M.D., Ph.D.
Associate Professor and Medical Director
Chief of Lung Radiation Oncology Service


Nathan Kim, M.D., Ph.D.
Associate Professor


Kiran Kumar, M.D., M.B.A.
Assistant Professor and Director of the Medical Residency Program
Chief of Lymphoma and Pediatrics Radiation Oncology Services


Xingzhe (Dillon) Li, M.D., M.P.H.
Assistant Professor

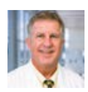

Dominic Moon, M.D.
Assistant Professor


Chika Nwachukwu, M.D., Ph.D.
Assistant Professor
Associate Director of the Medical Residency Program
Eugene P. Frenkel, M.D., Clinical Scholar


Asal Rahimi, M.D., M.S.
Associate Professor
Chief of Breast Radiation Oncology Service
Medical Director, SCCC Clinical Research Office
Department Associate Vice Chair of Diversity, Equity, and Inclusion

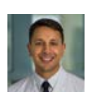

Nina Sanford, M.D.
Assistant Professor
Chief of Gastrointestinal Radiation Oncology Service
Dedman Family Scholar in Clinical Care


David Sher, M.D., M.P.H.
Professor and Associate Vice Chair for Clinical Operations
Chief of Head and Neck Radiation Oncology Service


Robert Timmerman, M.D., FASTRO, FACR
Professor and Chair
Holder of the Effie Marie Cain Distinguished Chair in Cancer Therapy Research


Dat Vo, M.D., Ph.D.
Assistant Professor


Andrew Wang, M.D.
Professor and Associate Vice Chair for Research
Holder of the A. Kenneth Pye Professorship in Cancer Research


Zabi Wardak, M.D.
Assistant Professor and Medical Director of the Gamma Knife Program
Chief of CNS Radiation Oncology Service


Kenneth Westover, M.D., Ph.D.
Associate Professor
Director of Clinical Innovation and Information Systems


Yuanyuan (Faith) Zhang, M.D., Ph.D.
Assistant Professor

UT Southwestern
Harold C. Simmons
Comprehensive Cancer Center

NCI Designated Comprehensive Cancer Center

Department of Radiation Oncology

5323 Harry Hines Boulevard

Dallas, Texas 75390-8546

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Photos by Brian Coats

For referrals or to schedule an appointment,
please call 214-645-8525.