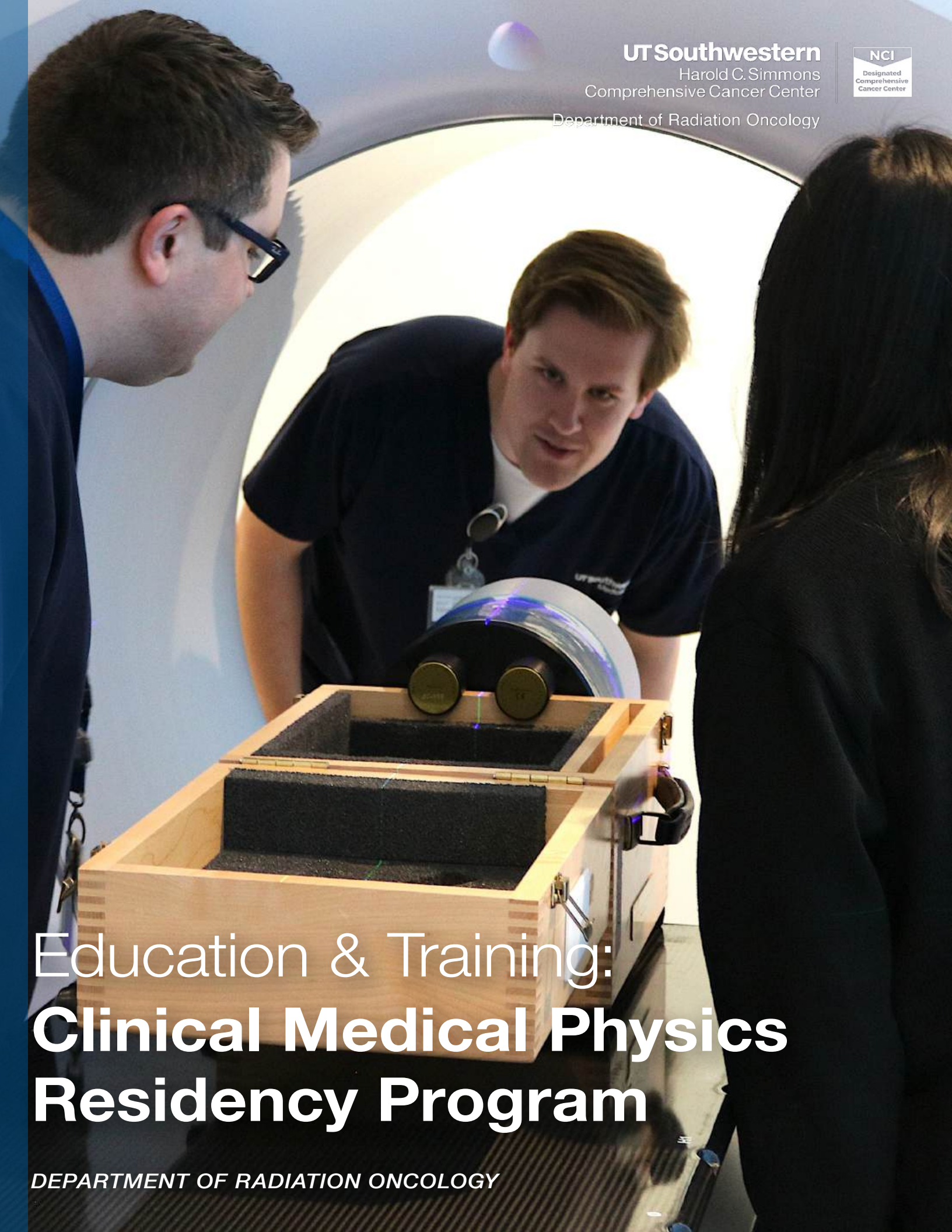


UT Southwestern

Harold C. Simmons
Comprehensive Cancer Center

Department of Radiation Oncology

A photograph showing three individuals in a clinical or educational setting. A man in a dark blue scrub top is leaning over a wooden box, pointing at a device inside. Two other people, a man with glasses on the left and a woman on the right, are looking at the device. The device appears to be a medical physics training tool, possibly a phantom or a detector, with two cylindrical components and a light source. The background is a plain, light-colored wall.

Education & Training: **Clinical Medical Physics Residency Program**

DEPARTMENT OF RADIATION ONCOLOGY



In UT Southwestern's Department of Radiation Oncology, state-of-the-art radiation technology meets human caring, compassion, and personalization.

Led by Robert Timmerman, M.D., FASTRO, FACR, Chair and Professor, the Department of Radiation Oncology provides world-class care to approximately 200 patients each day while conducting groundbreaking research in clinical radiation oncology, medical physics, and molecular medicine. As an integral part of its mission, the department offers cutting-edge research opportunities and robust educational programs to train the next generation of medical practitioners and scientists.

The mission of our department is three-fold: to deliver a radiation oncology care plan individualized to each patient's specific cancer and personal needs; to discover and improve understanding, foster collaboration, and ultimately, contribute to improving personalized clinical care; and to devise educational programs that fit the individual needs of the learner and to create professionals who see each patient as a unique person.

Our doctors, physicists, and researchers have devoted their lives to better understanding cancer and its treatment. Noted for groundbreaking research by our internationally recognized team, we deliver exceptional care to patients with all types and all stages of cancer. We are the only National Cancer Institute (NCI)-designated comprehensive cancer center in North Texas and one of only 57 NCI-designated comprehensive care centers in the nation. As such, we are held to the highest of standards and are recognized for excellence in clinical care, as well as scientific research and leadership. In addition, we are one of the largest practices in the Southwest.



2015

Harold C. Simmons Comprehensive Cancer Center receives National Cancer Institute (NCI) designation, becoming the first and only in North Texas.



2017

The new William P. Clements Jr. University Hospital Radiation Oncology Building opens, consolidating services at a 63,000-square-foot facility located at East Campus. It is the largest individual facility for radiation oncology in North Texas.



2020

The 12-story third tower at UT Southwestern furthering UTSW's position as a leader in cancer care and providing opportunities to integrate state-of-the-art GammaPod technology.

2005

Launch of Medical Residency Program

2009

Launch of Clinical Medical Physics Residency Program

2016

SBRT/SABr Training Program established, becoming the first advanced training program in the department. Developed to help oncology professionals learn about the proper implementation of a viable and effective SBRT/SABr treatment practice.



2019

First patient is treated on the GammaPod, which is the first stereotactic body radiation therapy (SBRT) system optimized for treating breast cancer, focused on reducing treatment time and potentially lowering toxicity. UTSW is the first center in Texas and second in the world to offer this technology.



Our physicists and physicians are organized into disease-oriented teams that specialize in treating a particular type of cancer. Every member of these teams contributes their focused expertise toward building personalized treatment plans that leverage the powerful technology at our facilities for our patients.

We perform a broad range of radiation oncology procedures including MR-guided radiation therapy (RT), adaptive RT, biologically guided RT, MRI, IMRT, SBRT, TBI, TMLI, TSE, and HDR brachytherapy. Our department has a collection of the most sophisticated treatment machines and planning systems capable of treating all types of cancer, including:

- Two Varian VitalBeams
- Four Elekta Versa HDs
- Two Varian Ethos
- Two Varian Halcyon
- Accuray CyberKnife M6
- Two Elekta Gamma Knife Icons
- Xcision GammaPod
- Two Elekta Unity MR linacs
- RefleXion PET linac
- Xstrahl superficial unit
- Elekta Flexitron HDR afterloader
- Varian VariSource HDR brachytherapy suite
- Philips 1.5 Ingenia Ambition MR simulator
- Two Philips 16-slice Brilliance 4D CT simulators
- Ten Vision RT systems
- Varian Eclipse
- Elekta Monaco
- Elekta Oncentra
- Eye plaque brachytherapy
- GammaTile (brain)
- Intravascular brachytherapy
- Brainlab AIRO mobile, compact CT-simulator
- GE HealthCare Omni Legend PET-CT simulator
- New GE CT scanners (coming soon)



William P. Clements Jr. University Hospital opens, becoming a leading provider of health care and broadening research and education with clinical care. It includes a Gamma Knife suite, equipped with two Gamma Knife Icon.



2022

First patient treated on RefleXion, a treatment machine that incorporates PET imaging with radiotherapy.



2025

Groundbreaking of Radiation Oncology expansion in Fort Worth begins, with an expected opening in 2027.

2021

Completed 71,000-square-foot expansion of Radiation Oncology services, heralding a new avenue of treatment to patients of adaptive therapy. Our first adaptive patient was treated in June 2021; our first adaptive MR-linac patient was treated in August 2021.



2022

The North Campus Outpatient Cancer Care and Brain Research towers opened, which house research efforts of the Peter O'Donnell Jr. Brain Institute and outpatient care and clinical trials space for the Harold C. Simmons Comprehensive Cancer Center.



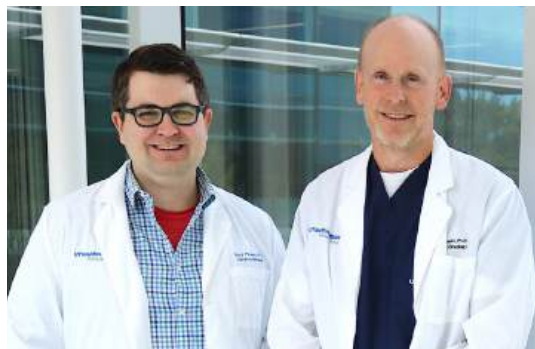
2025

The Department of Radiation Oncology's Veterinary Research and Oncology Clinic (VROC) opens, offering advanced cancer care for pets while contributing to groundbreaking research in comparative oncology.



Clinical Medical Physics Residency Program

Our department is home to one of the largest clinical medical physics residency programs in the world. Led by Paul Medin, Ph.D., Professor and Program Director, and David Parsons, Ph.D., Assistant Professor and Associate Program Director, our program is a two-year, CAMPEP-accredited program emphasizing clinical excellence and academic career development in radiation oncology physics. The program is comprised of more than 80 physics and engineering, molecular medicine, and physician faculty. The current annual clinical medical physics resident salary is **\$70,101** for PGY1, **\$72,672** for PGY2, and **\$76,167** for PGY3 (fellow).



Residency program directors, Drs. Parsons and Medin.

- Applicants must have a Ph.D. degree or equivalent in medical physics, physics, or a closely related field.
- Applicants must qualify to receive a temporary license through the Texas Medical Board (TMB).
- Applicants must submit their CV, a personal statement, a statement of their visa status, three reference letters, and transcripts from graduate and undergraduate schools.

All applications must be submitted through our updated portal. Scan the QR code for detailed instructions and access to the application system. Please review the information carefully before starting your application. **Applications for July 2026 start date are due September 30, 2025.**



Graduation Requirements

- Completion of all eight clinical rotations
- Completion of two full years of clinical training
- Four quarterly written reports
- Completion of 24 oral exams
- Ethics and professionalism modules
- Education conferences, meetings, lectures, chart rounds, and tumor boards
- Teach three lectures per year
- Must maintain a clinical competency rating of “satisfactory” as determined by the Clinical Competency Committee

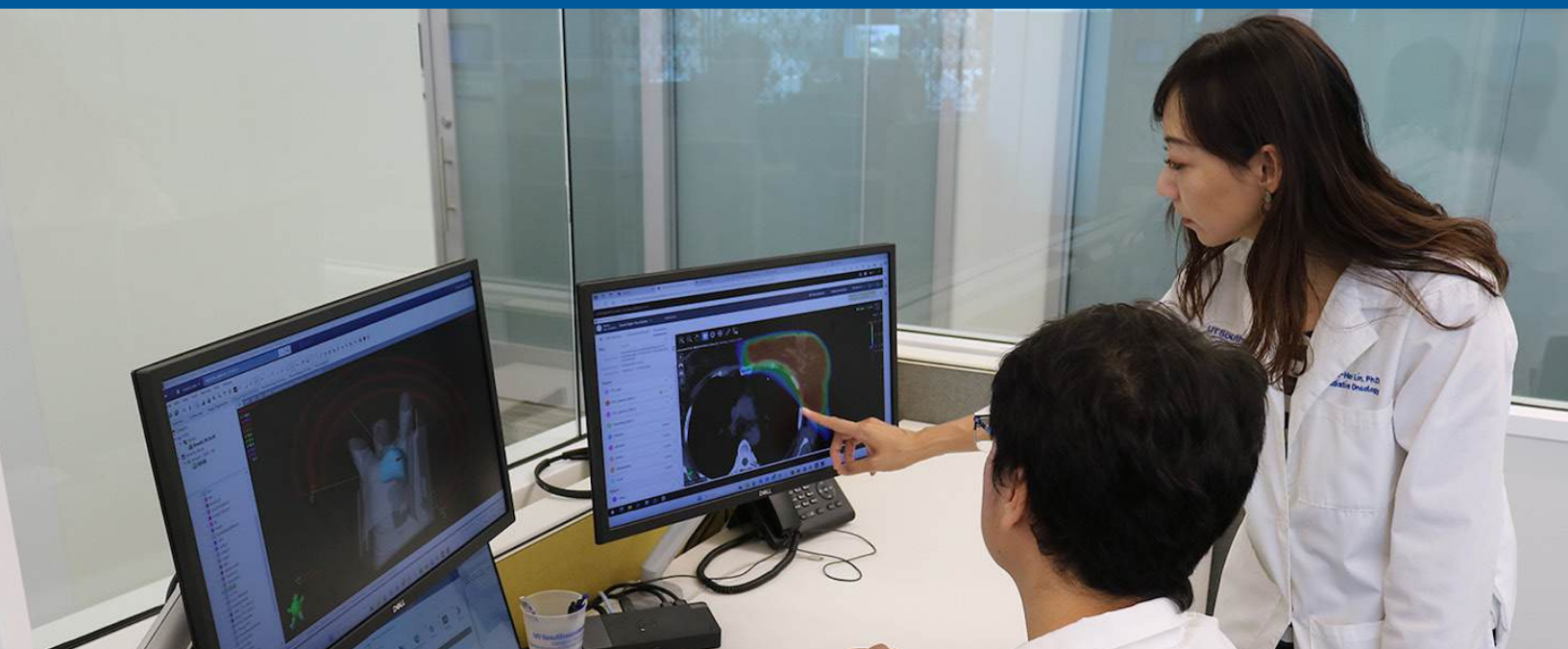
Available Elective Rotation Topics

- 3D printing
- Artificial intelligence
- API scripting
- GammaPod
- Advanced CyberKnife
- Advanced dosimetry
- Advanced brachytherapy
- Advanced adaptive radiotherapy
- Advanced Gamma Knife
- Advanced machine QA
- Commissioning
- RefleXion
- MRI for radiation oncology
- Radiation oncology clinical survey
- DICOM and clinical trials

Clinical Medical Physics Resident Duties

Clinical medical physics residents are trainees immersed in the clinical operations of radiation oncology and are valued members of the clinical team. Residents learn and support each clinical service as they progress through the program. Specific duties a resident can expect to perform in the program include:

- Linac weekly, monthly, and annual QA
- CT and MRI monthly QA
- Acceptance and commissioning of equipment
- Treatment planning (all services)
- Radioactive material calibration and delivery
- Clinical improvement projects
- Total body irradiation planning and support
- Total skin electron therapy planning and support
- Optically stimulated luminescence dosimetry
- 3D bolus fabrication
- Superficial radiation therapy simulation and calculations
- Surface-guided radiation therapy support
- CBCT dose recalculation
- Weekly/final chart checks
- CyberKnife IMRT QA
- Emergency IMRT QA
- Electron output factor measurement
- Supervised physicist of the day
- Adaptive treatment planning and on-console support



An integral part of the department, residents will experience:

- Uniquely diverse and personalized clinical training with access to state-of-the-art technology
- Hands-on experience with a full complement of special procedures
- Invaluable insight from a number of physics and engineering faculty focused primarily on research that is well-funded by the NIH, American Cancer Society, Radiological Society of North America, Cancer Prevention & Research Institute of Texas, and various corporations

Treatment Planning/ Ethos	1	Treatment planning techniques
	2	Modern dosimetry
	3	Monitor unit calculations
ART/Unity	4	MRI and PET imaging
	5	MRgRT and adaptive radiotherapy
	6	SBRT
Brachytherapy	7	Radioactive isotopes: TG43 and model-based calculations
	8	Treatment planning for brachytherapy
	9	Radioactive isotopes: regulations and brachytherapy QA
Stereotactic	10	MV photon/electron shielding design and accepted dose limits
	11	kV photon and isotopes shielding design
	12	Stereotactic radiosurgery
Special Procedures	13	Total body irradiation (TBI) and total skin electrons (TSE)
	14	AAPM Task Groups-142
	15	AAPM Task Group-51 Calibration
Treatment Delivery/TPOD	16	In vivo dosimetry
	17	Simulation/CT/IGRT
	18	Pregnant patients/pacemakers/hip replacements
Elective Rotation 1	19	LINAC design and function
	20	AAPM Task Groups-25/70 Electrons
	21	Proton therapy and heavy ion therapy
Elective Rotation 2	22	TG-100 lab
	23	Elective oral
	24	All Residency Comprehensive

FIGURE 1A. Physics Resident Rotations and Oral Exam Topics

Date	Month	Week	1st year				2nd year			
			Res 1	Res 2	Res 3	Res 4	Res 5	Res 6	Res 7	Res 8
2023	July	1	1	7	13	19	16	18	21	4
2023	August	2	2	8	14	21	17	20	19	5
2023	September	3	3	9	15	22	18	21	20	6
2023	October	4	4	1	7	23	19	20	16	21
2023	November	5	5	2	8	24	20	23	17	18
2023	December	6	6	3	9	25	21	22	18	20
2024	January	7	13	4	1	7	16	16	11	18
2024	February	8	14	5	2	8	17	17	10	16
2024	March	9	15	6	3	9	18	18	23	23
2024	April	10	7	13	4	1	22	22	22	22
2024	May	11	8	14	5	2	23	23	12	17
2024	June	12	9	15	6	3	24	24	24	24
2024	July	13	16	16	21	4				
2024	August	14	17	20	18	5				
2024	September	15	18	21	20	6				
2024	October	16	19	16	10	21				
2024	November	17	20	17	11	18				
2024	December	18	21	18	12	20				
2025	January	19	10	13	18	16				
2025	February	20	11	10	16	17				
2025	March	21	12	23	23	18				
2025	April	22	22	22	22	22				
2025	May	23	23	12	17	23				
2025	June	24	24	24	24	24				

FIGURE 1B. Physics Resident Rotation Schedule Example

2025 medical physics residents with program directors and medical physics leadership.

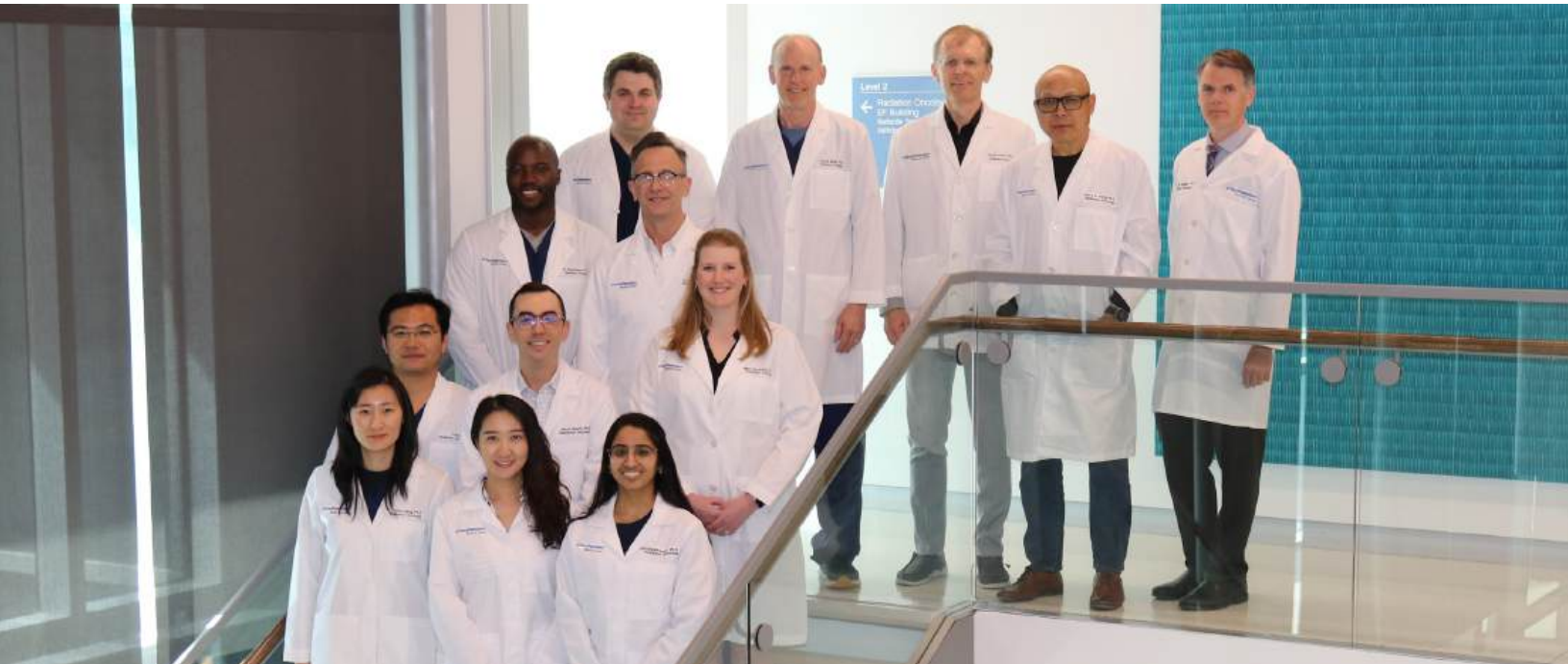


FIGURE 2A. Physics
Resident Private vs.
Academic Alumni
Statistics (as of June 30,
2025)

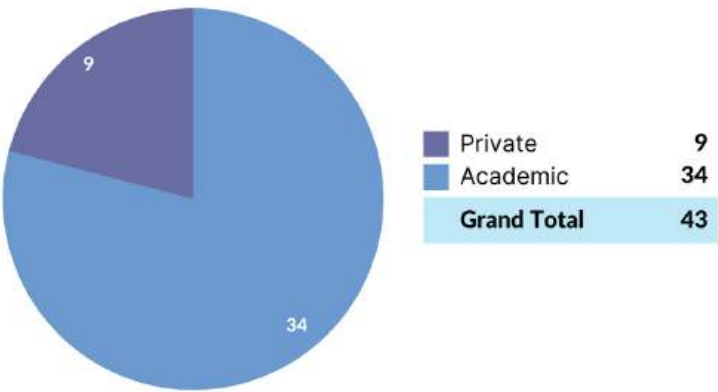
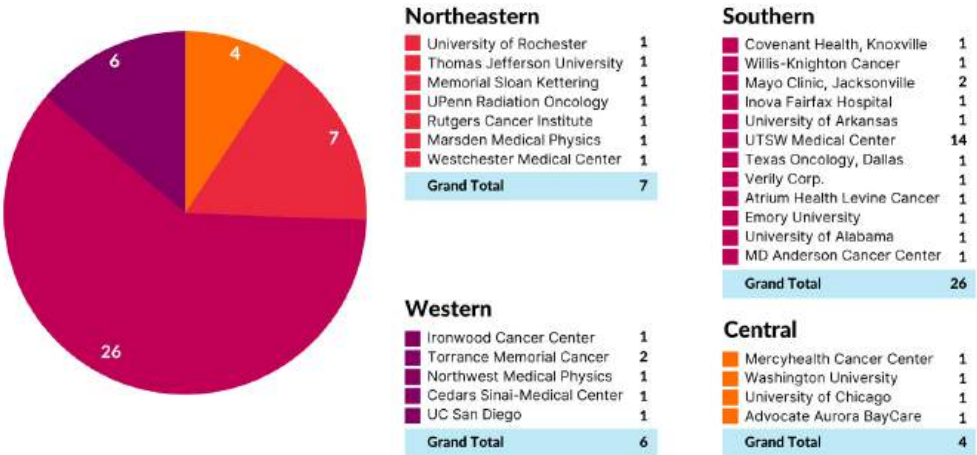


FIGURE 2B. Physics
Resident Alumni Statistics
by Region (as of June 30,
2025)



Life in Dallas

Dallas is one of the most populous cities in the Dallas-Fort Worth metroplex and fourth in the United States. A thriving economy, lower cost of living, no state income tax, and central location make it attractive to individuals, families, and companies looking to relocate.

The metroplex is consistently ranked as one of the top areas for growth in industry headquarters and statistically adds one new local resident every five minutes. Dallas has earned a solid reputation in a variety of areas including culture, dining, sports, outdoors, and shopping.



A close-up of a robotic hand, likely a prosthetic or surgical robot, with a blue network overlay. The hand is white and has several joints and sensors. The background is a dark blue with a glowing blue network of lines and nodes, suggesting a digital or artificial intelligence theme.

Medical Artificial Intelligence and Automation (MAIA) Lab

The MAIA lab is a multi-PI lab established in July 2017 within the Department of Radiation Oncology. The lab's main objective is to innovate, develop, and apply artificial intelligence (AI) technologies to empower clinicians, especially those with less experience or limited resources, for improved patient care from these aspects:

- Improve accuracy by retrieving hidden information from patient data/images and performing better than (most) physicians when there is ground truth
- Precise diagnosis and better clinical decision making
- Improve efficiency by automating clinical procedures and saving physicians time in front of computers
- Re-humanize medicine
- Transfer expertise to less experienced physicians by learning from experienced physicians when there is no ground truth
- Reduce health care disparities

Program Characteristics

- 39 faculty, 28 lab members (students, postdocs, residents, research assistants, supporting staff, etc.)
- Most faculty have both clinical and research duties
- 9 active R01s, 1 active R37, 2 active R44s, 14 pending R01s, 1 pending R43, 2 pending R41s, 1 pending K99, 2 pending R21s

Artificial Intelligence for Radiation Therapy

Residents in our program will have the opportunity to participate in the translation and clinical evaluation of AI technologies developed by faculty and trainees in the MAIA lab.

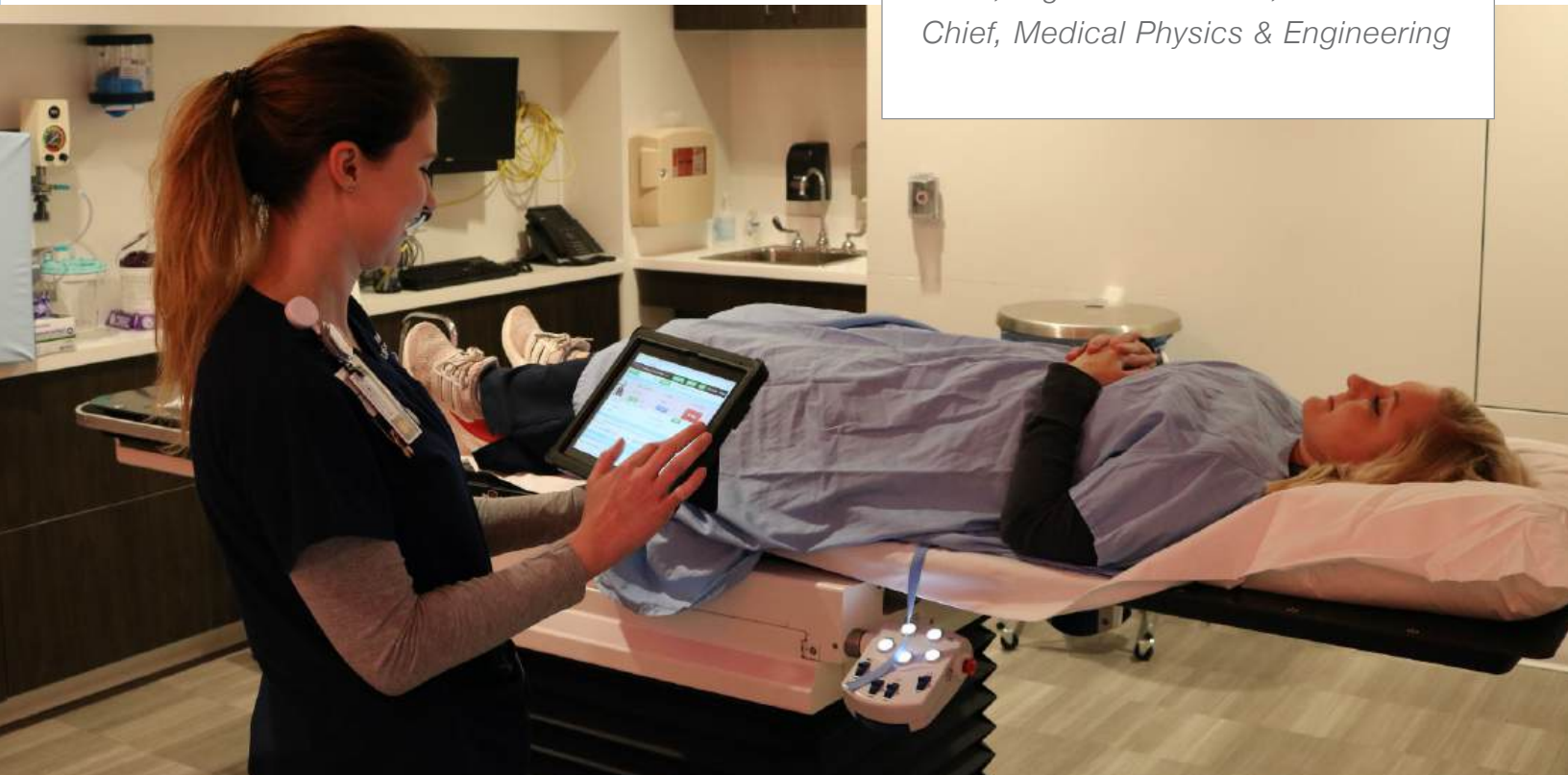
The research in the MAIA lab covers the use of AI in various aspects of cancer radiotherapy, including, but not limited to, organ segmentation, target delineation, dose prediction, treatment planning, outcome prediction, image processing, and smart clinics. A main focus of our AI research is on the safe and effective deployment of AI in clinical practice to solve important clinical problems.

AI for Smart Clinic

- Infrastructure using Bluetooth technology
- Tracking patients, clinical staff, and devices
- First app in clinic: A touchpad checklist before treatment steps are taken and to ensure correct devices are used



*Steve Jiang, Ph.D., FAIMBE, FAAPM;
Professor of Radiation Oncology; Vice
Chair, Digital Health & AI; and Division
Chief, Medical Physics & Engineering*



Medical Physics Adaptive Radiotherapy Fellowship

To combat the shortage of physicists who are quality primary providers skilled in adaptive radiotherapy (ART), our department offers a Texas Medical Board-approved, two-year Medical Physics Adaptive Radiotherapy Fellowship (MPART).

UT Southwestern Medical Center is the only institution in the world that has multiple advanced ART treatment modalities, and we aim to train the next generation of top-tier medical physicists. These ART treatment modalities include CBCT-guided and MR-guided adaptive radiation therapy and PET-guided radiation therapy.

COURSE LEADERSHIP

Bin Cai, Ph.D.

Associate Professor of Radiation Oncology
and Director of Advanced Medical Physics



FIGURE 3.
PY 1 and PY 2 ART
Fellowship Blocks
Diagram

Medical Physics Adaptive Radiotherapy Fellowship Block Diagram					
PY 1					
Blocks	1 (1 Month)	2 (3 Months)	3 (3 Months)	4 (3 Months)	5 (2 Months)
Rotation Name	Adaptive radiotherapy orientation and radiation/MR safety training	CT- or CBCT-guided adaptive radiotherapy	MR-guided radiotherapy and adaptive radiotherapy	PET-guided radiotherapy and biology-guided radiotherapy	Research and clinical development
% Clinical effort	100	100	100	100	20
% Clinical development effort					80
PY 2					
Blocks	1 (3 Months)	2 (3 Months)	3 (3 Months)	5 (3 Months)	
Rotation Name	CT- or CBCT-guided adaptive radiotherapy	MR-guided radiotherapy and adaptive radiotherapy	PET-guided radiotherapy and biology-guided radiotherapy	Research and clinical development	
% Clinical effort	100	100	100	20	
% Clinical development effort				80	

Postdoctoral Medical Physics Certificate Program

This CAMPEP-accredited program provides postdoctoral fellows with essential medical physics didactic elements for entry into the medical physics profession, particularly medical physics residencies. The program offers the following courses:

- Radiological Physics and Dosimetry
- Radiation Therapy Physics
- Radiation Protection and Safety
- Fundamentals of Imaging in Medicine
- Radiobiology
- Anatomy and Physiology

The program is offered to current radiation oncology postdoctoral fellows and all six courses

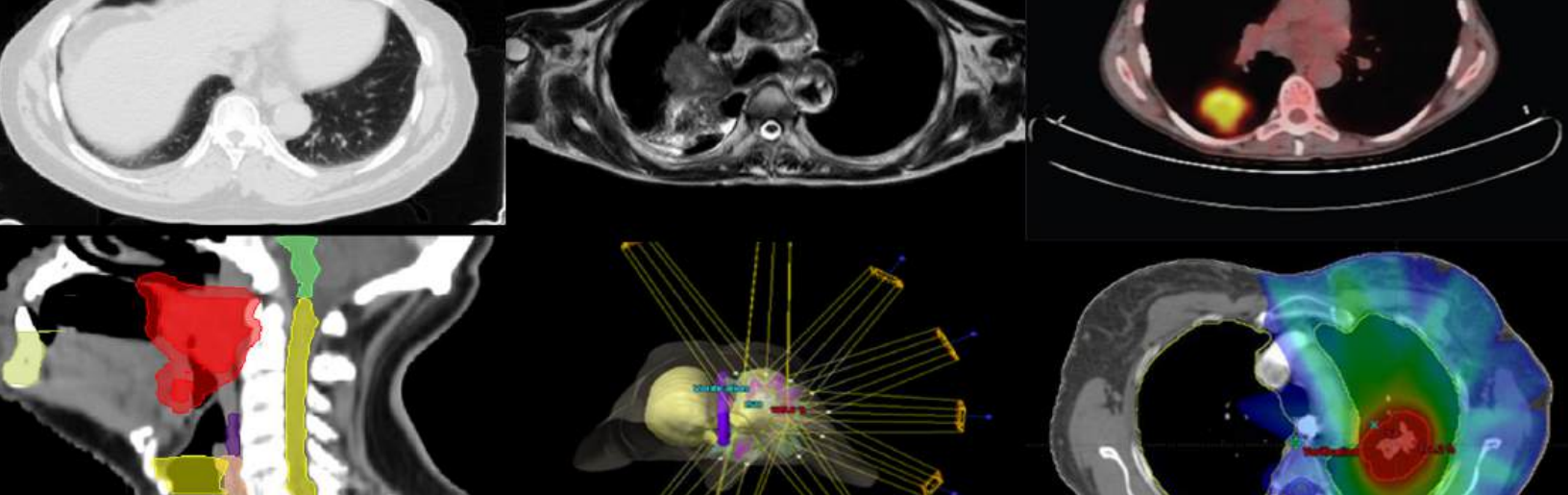
are offered to graduate students of the Biomedical Engineering (BME) Graduate Program. Since the program is offered to internal candidates only, we do not have a strict application deadline. Students can start to take courses for the program in either fall or spring.

**A prerequisite for the American Board of Radiology certification is completion of a Postdoctoral Medical Physics Certificate Program.*

COURSE LEADERSHIP

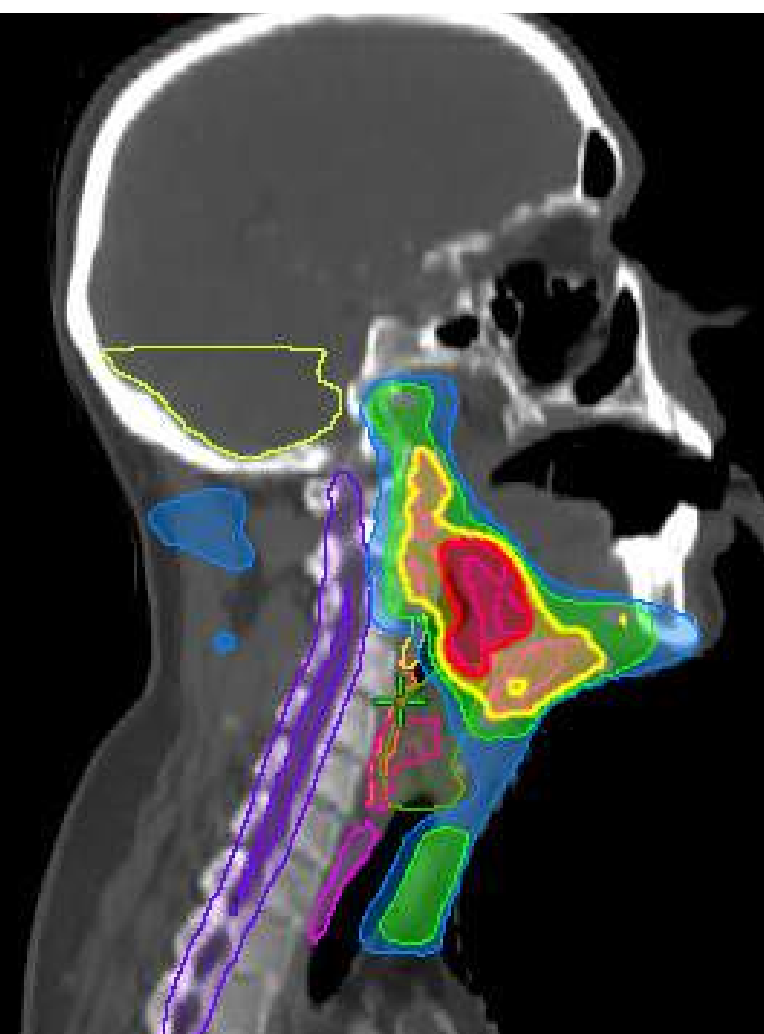
Dan Nguyen, Ph.D.
Associate Professor of Radiation Oncology





Biomedical Engineering Graduate Program – Medical Physics Track

The research focus of this CAMPEP-accredited program is development of cutting-edge imaging and therapeutic tools to help cancer radiotherapy treatment. This program is offered to students with undergraduate training in physics, engineering, computer science, or related physical sciences who are looking to establish a career in clinical or medical physics research. Applications open **August 1, with a December 1 deadline**. Students are accepted for fall admission only, with 5.5 years as the average time to degree completion.

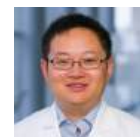


COURSE TOPICS

- Medical image reconstruction and application in radiotherapy
- Radiotherapy treatment planning and adaptive replanning
- High-performance computing for radiotherapy, such as Monte Carlo radiation transport simulation
- Modeling of organ motion
- Developing advanced imaging and therapeutic approaches
- Modeling radiobiological phenomena and understanding the mechanisms
- Applying AI technologies in radiotherapy

COURSE LEADERSHIP

You Zhang, Ph.D.
Associate Professor of Radiation Oncology



SBRT/SAbR Training Program

The Department of Radiation Oncology offers a Stereotactic Body Radiation Therapy (SBRT)/Stereotactic Ablative Radiotherapy (SAbR) training program, the longest running of its kind in the U.S. Radiation oncologists, medical physicists, medical dosimetrists, administrators, and radiation therapists interested in implementing SBRT/SAbR into clinical practice are encouraged to attend this CME program.

FOR MORE INFORMATION

The SBRT Training Program is offered several times a year. For the most updated course dates, please reach out to SBRTProgram@UTSouthwestern.edu.

COURSE LEADERSHIP

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



Justin Visak, Ph.D.
Assistant Professor of Radiation
Oncology



4,938

SBRT/SABR TREATMENTS FOR FY25

FIGURE 4.
SBRT/SAbR Training Program
Course Attendees by Country





833

GAMMA KNIFE TREATMENTS FOR FY25

Gamma Knife Training Program

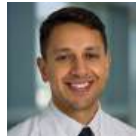
The Gamma Knife Training Program, geared toward radiation oncologists, neurosurgeons, neuro-otologists, and medical physicists, provides a comprehensive understanding for both new and experienced users. The CME/CAMPEP-accredited program offers a new user four-day course, as well as a three-day course for experienced Gamma Knife users upgrading to Icon.

FOR MORE INFORMATION

The Gamma Knife Training Program is offered several times a year. For the most updated course dates, please reach out to GammaKnifeProgram@UTSouthwestern.edu.

COURSE LEADERSHIP

Zabi Wardak, M.D.
Associate Professor of Radiation Oncology
Medical Director of the Gamma Knife Training Program



Strahinja Stojadinovic, Ph.D.
Professor of Radiation Oncology
Co-Director of the Gamma Knife Training Program



Toral Patel, M.D.
Associate Professor of Neurological Surgery

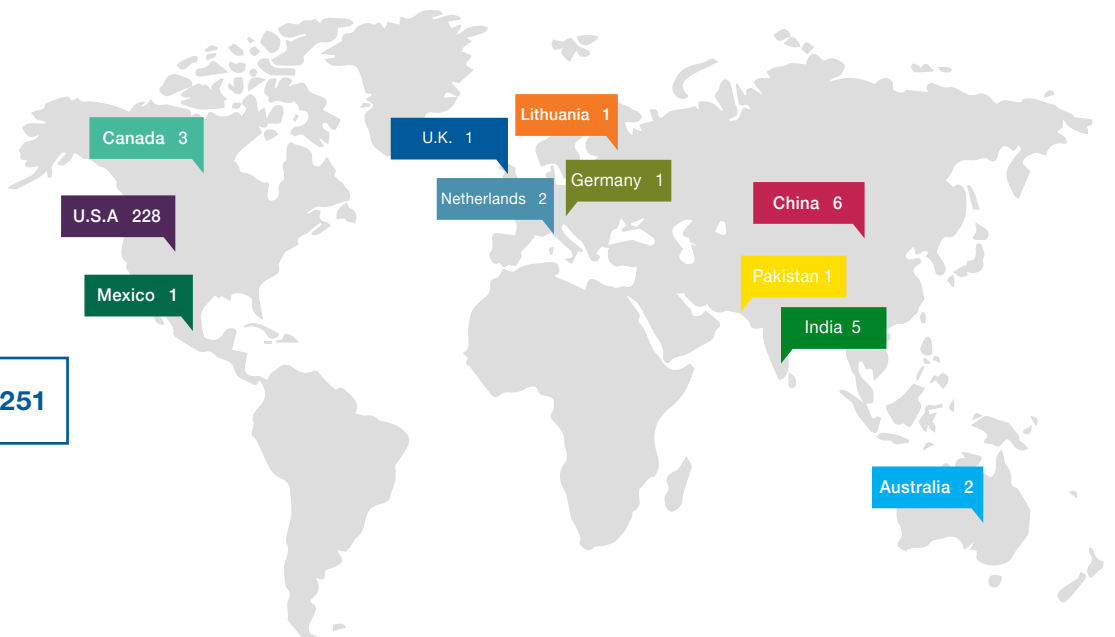


Robert Timmerman, M.D., FASTRO, FACR
Chair and Professor of Radiation Oncology



FIGURE 5.

Gamma Knife Training Program Course Attendees by Country



GRAND TOTAL 251

Simulation Center

UT Southwestern's Simulation Center, one of the largest in the United States, replicates and creates virtual environments for training in clinical care and procedures. The enhanced simulation program provides training in 13 competencies, or entrustable professional activities (EPA), and includes valuable hands-on instruction in more than two dozen course areas.

Our simulation training and activities are accredited by some of the nation's leading organizations. Future simulation projects include:

- Creating a series of simulation mastery-based labs to teach brachytherapy procedures and elective rotations for MRI-guidance
- Adaptive therapy
- 3D printing
- Particle therapy
- Artificial intelligence



UT Southwestern
Harold C. Simmons
Comprehensive Cancer Center
Radiation Oncology

UT Southwestern is an Equal Opportunity Employer.

CONTACT US

2280 Inwood Road, Dallas, Texas 75390
214-645-8525

FOR MORE INFORMATION, VISIT OUR WEBSITES

Education: utsouthwestern.edu/radonc
Patient Information: utswmed.org/rad-onc

FOLLOW US ON SOCIAL MEDIA

 Facebook.com/UTSWRadiationOncology
 x.com/UTSW_RadOnc
 Instagram.com/utswradonc
 LinkedIn.com/showcase/ut-southwestern-radiation-oncology

FOR PHYSICS PROGRAM INFORMATION, CONTACT:

Kiera.Smith@UTSouthwestern.edu