



Department of Radiology

Impact Report 2023

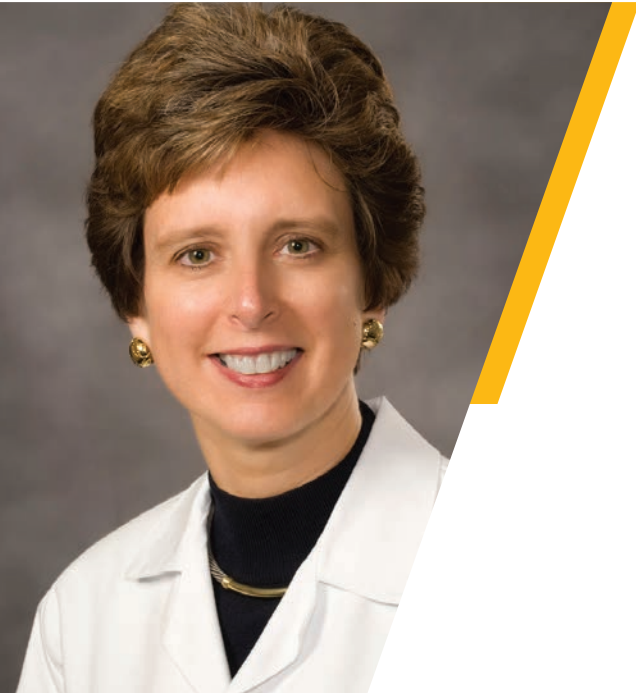
Image of Excellence

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The
answers
start here

A LETTER FROM THE CHAIR



For the Virginia Commonwealth University Department of Radiology, the past year has been both transformative and enlightening. During this time, we learned a great deal about ourselves and saw firsthand the invaluable role radiology plays in elevating health care at VCU Health and in the community. I am delighted to share our accomplishments and collaborations in our 2023 Impact Report.

We in the Department of Radiology have a guiding, motivational mantra, “**Image of Excellence.**” This mantra provides the foundation of our proud tradition of excellence, which is built on our priorities of patient care, safety, education, research and innovation. Therefore, even as we take on new responsibilities and forge new partnerships, we remain devoted to our mission and service goals.

As we look ahead, we know that possibilities only become realities with a shared commitment to the community and a heroic effort to instill in our medical students, residents and fellows the values and knowledge needed to provide life-saving care for many years to come.

Be well,

A handwritten signature in purple ink that reads "Ann S. Fulcher, M.D.".

Ann S. Fulcher, M.D., FACR, FSAR, FSAB
Professor and Chair, Department of Radiology



We are led by a mission and guided toward a vision

Our Mission

We are dedicated to our Image of Excellence and we fulfill our mission through the following pillars:

- / To provide optimal care in a patient-centered environment
- / To provide subspecialty expertise
- / To provide top-quality imaging and therapeutic procedures
- / To advance medical education and research

Our Vision

Our vision is to be recognized nationally and internationally as a world-class radiology department.

"I honestly do not have the words to express what an amazing experience it was to take this journey through the Radiology service and to meet the incredible professionals who work there. To the very last one, they were compassionate, empathic and extremely adept at their skills and, most importantly, uniquely able to convey how much they cared.

Thanks to you, Dr. Fulcher, for the leadership and skills that you have displayed in assembling such a compassionate and competent crew. This has truly been the most amazing medical experience I have ever had, and from it I will take lessons to apply to our own surgical practice in the Department of Periodontics at the VCU School of Dentistry."

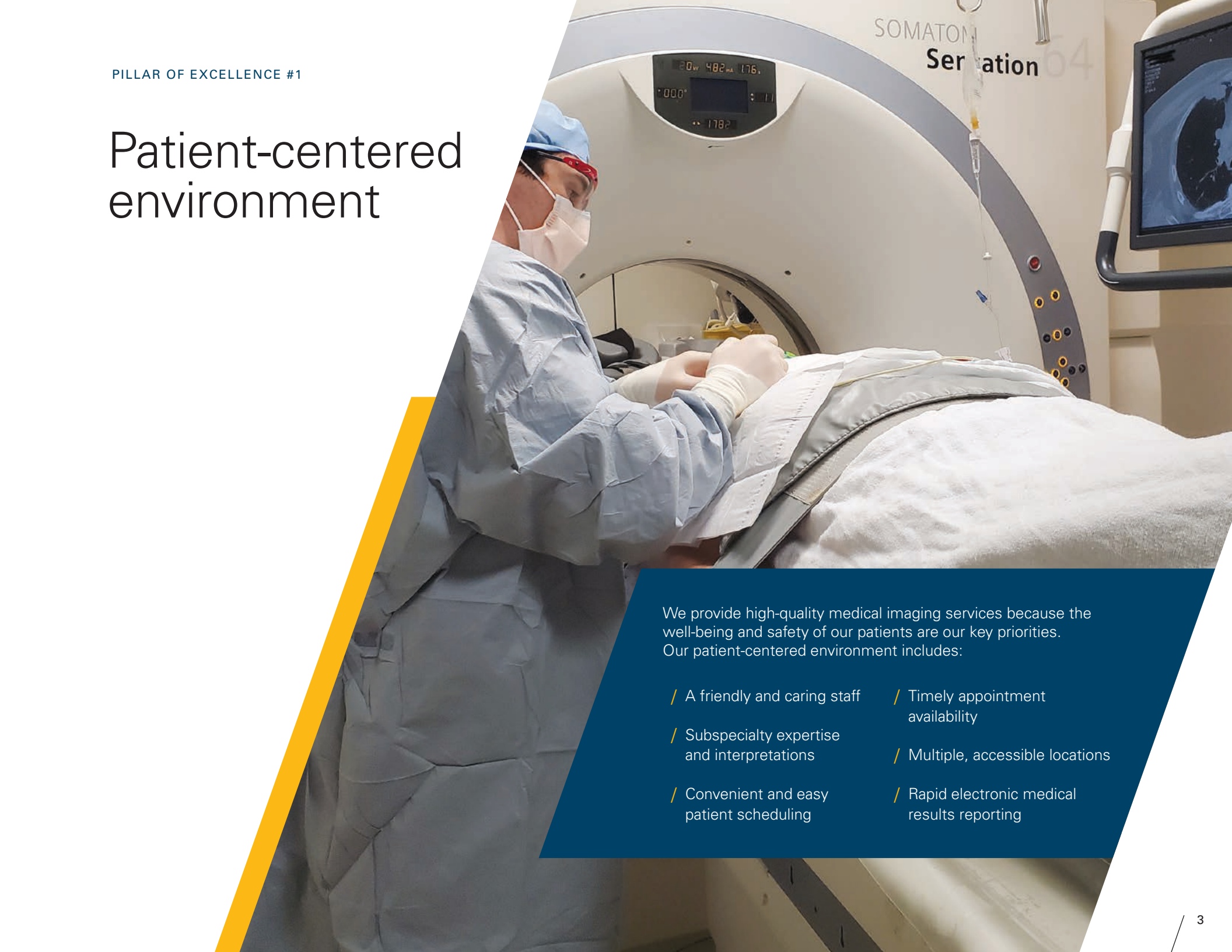
– Rob Sabatini, D.D.S., M.S.
Associate Professor,
Department of Periodontics, VCU School of Dentistry

OUR COMMITMENT TO

Diversity, Equity and Inclusion

The VCU Department of Radiology acknowledges our responsibility to condemn racism and all forms of discrimination. Together with the University and Health System, we are committed to the principles of diversity, equity and inclusion. We will continue to foster a welcoming community and encourage open dialogue that supports and values people of all cultural backgrounds and life experiences, and to develop a truly inclusive environment based on human dignity and mutual respect.

Patient-centered environment



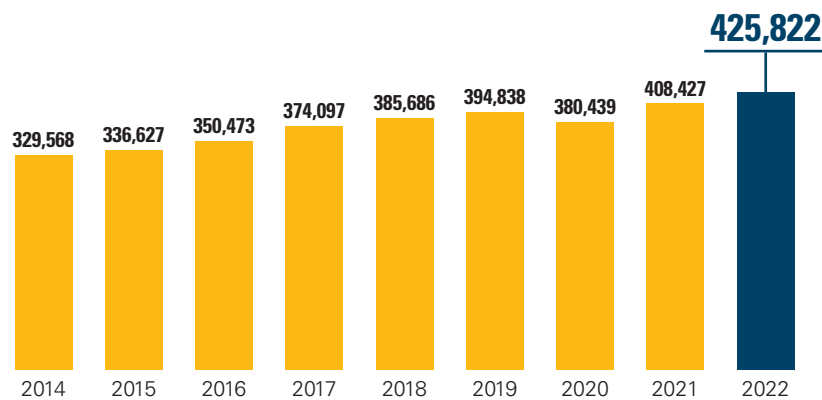
We provide high-quality medical imaging services because the well-being and safety of our patients are our key priorities. Our patient-centered environment includes:

- / A friendly and caring staff
- / Subspecialty expertise and interpretations
- / Convenient and easy patient scheduling
- / Timely appointment availability
- / Multiple, accessible locations
- / Rapid electronic medical results reporting

Proof of performance in a year like no other

VCU Department of Radiology total exam volume

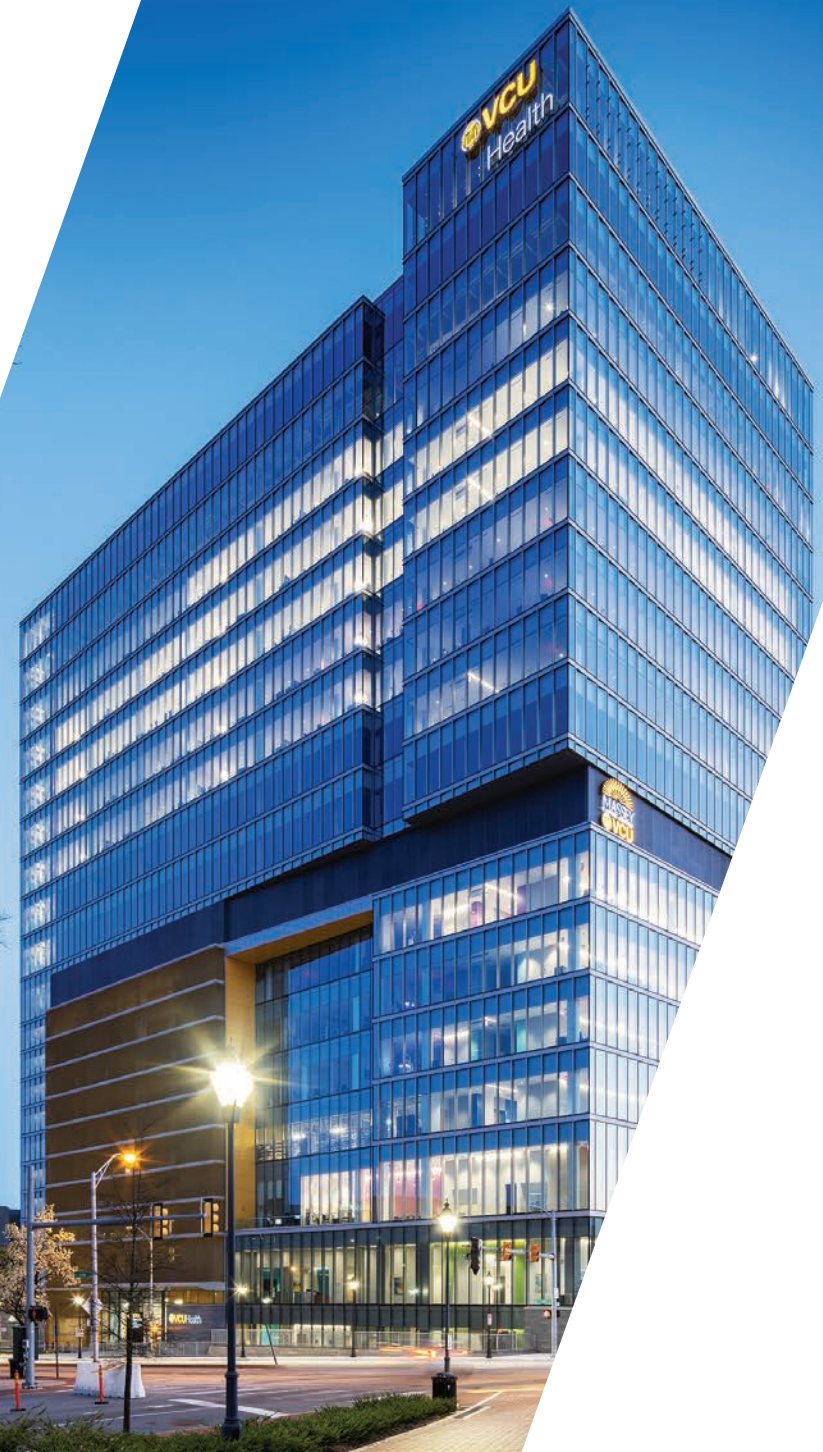
The Department's volume has seen steady increases over the years.



"Kristi and Lauren, words can't express how grateful I am to you both for taking such good care of my daughter during her arthrogram and MRI. She was nervous about getting the needles and your kindness and authenticity were just what we both needed."

– Parent of VCU Health Pediatric Patient

VCU Medical Center
Adult Outpatient Pavilion.



Accomplishments in the face of challenge

QUALITY INITIATIVES

In 2021–2022, we faced the ongoing COVID-19 pandemic; the integration of EPIC, VCU Health's new electronic health record system; and the launch of the new Adult Outpatient Pavilion's imaging services. The VCU Department of Radiology took on all these challenges, and concurrently accomplished several impactful projects. Among them:

- / Completion of the **VCU Health Main 3 Radiology Renovation and Expansion Project**. The \$50 million, three-year project created a newly re-imagined space for Radiology in downtown Richmond, Virginia.
- / In 2022, GE HealthCare experienced significant supply chain interruptions due to COVID-19 restrictions resulting in a **global shortage of iodinated contrast material**. Before the shortage escalated, the VCU Department of Radiology acted quickly and formed a multidisciplinary team that introduced various measures to both conserve available contrast media inventory and maintain a steady supply of new inventory. Our quick action allowed us to continue the best imaging possible with minimal impact to patients during the crisis.
- / Led by Ann Fulcher, M.D., our VCU Enterprise Wide Imaging Safety and Compliance Initiative brought **standardization to the performance and quality assurance of point-of-care ultrasound (POCUS)** to enhance patient quality of care throughout the VCU Health System, including Tappahannock Hospital and Community Memorial Hospital. Sonya Echols, Ph.D., RT, VCU Department of Radiology Imaging Safety and Compliance Manager, and David Evans, M.D., Professor of Emergency Medicine and Radiology and Clinical Ultrasound Division Chair, spoke about the Initiative at a preconference session on POCUS at the 2022 American College of Radiology Quality and Safety Conference.
- / Since 2014, The Joint Commission (TJC) has deemed the **Interventional Radiology inventory management process** a best practice. A detailed inventory accounting system, where every item can be tracked back to the patient, is unique to the supply tracking process. This system reduces waste and cost, improves quality outcomes and allows for swift action in the event of a recall. Our team received recognition at the 2018 Vizient National Conference, where they presented the implementation process and shared key performance indicators.
- / The VCU Department of Radiology Imaging Safety and Compliance Office, in collaboration with VCU Health Purchasing and Information Technology Services, implemented a streamlined, enterprise-wide **Lead Asset Procurement Program** for ionizing radiation protective lead assets. By 2022, the program brought a 60 percent cost reduction in lead asset purchases while also increasing compliance with lead asset storage to improve workplace safety.
- / The VCU Department of Radiology collaborated with the VCU Cardiology and Electrophysiology Departments, device clinic team members and pacemaker device manufacturers' representatives to implement a **Nonconditional MRI Pacemaker Program** in 2017. Since that time, VCU Health's nonconditional pacemaker patient population has nearly tripled in volume; we currently average five nonconditional pacemaker MRI patients weekly and 15 outpatient nonconditional pacemaker MRI patients per month. VCU Health is the only hospital in the area performing exams on patients with nonconditional pacemaker devices.
- / The interdepartmental **Adult CT Trauma Average Turn Around Time (TAT) Initiative** expedites the care of critically injured patients and improves outcomes by reducing CT table time from 20 minutes to 5 minutes. The 75 percent timesaving was achieved by decreasing the amount of topograms and combining multiple protocols. The initiative also led to a reduction of total IV contrast volume from 200 milliliters to 100 milliliters, improving cost savings. In 2020, a trauma protocol was developed and modified specifically for the pediatric population, mirroring similar workflow and results.
- / Through the **PowerScribe Template Build**, radiologist reporting templates for imaging studies were designed and implemented in accordance with national guidelines. Templates were standardized across all imaging sections in November 2021.



As we work together to excel, our entire system benefits

Quality initiatives: ensuring excellence through collaboration

At the VCU Department of Radiology, we know the VCU Health System relies on excellence in imaging to move patient care forward—so we take great measures to ensure quality in our Department, day after day.

For quality management data analysis and projects, we work hand-in-hand with VCU Health's Performance Improvement Office and Office of Regulatory Affairs. This collaborative team uses Six Sigma and Institute for Healthcare Improvement Patient Safety Guidelines as frameworks to guide quality improvement initiatives. Methods employed by this group include the Plan-Do-Study-Act method, Lean Six Sigma Green Belt, and 5Whys problem-solving strategy.

Measurable quality objectives, goal measurement and the prioritization of activities are identified, implemented and tracked within the Radiology Department Quality Assurance and Performance Improvement (QAPI) Committee Charters; QAPI Data Dashboards; and Radiology Operations, Quality and Regulatory Dashboards.

Our Department's Radiology QAPI Committees, Radiology Management Group, Radiology Executive Committee and the Quality Oversight Committee all play a part in reviewing patient safety data, identifying incidents including medical errors and adverse patient events, and creating action plans to reduce risk.

"Our Department can take great pride in this achievement, as DICOE designation is validation of our ongoing commitment to quality care, patient safety and efficiency. Radiology plays a significant role in health care, so this one-of-a-kind recognition elevates both our staff, who are often behind the scenes, and the VCU Health System."

— Ann S. Fulcher, M.D.

Awarded American College of Radiology Diagnostic Imaging Center of Excellence Status (DICOE)

ACCREDITATIONS AND CERTIFICATIONS



Crowning achievement: the VCU Department of Radiology is named a Diagnostic Imaging Center of Excellence

The VCU Department of Radiology gained Diagnostic Imaging Center of Excellence® (DICOE) recognition from the American College of Radiology (ACR). It is a designation reserved for the leaders in our field—and we were able to earn this distinguished ranking in the midst of the COVID-19 pandemic. The DICOE program, which represents the pinnacle of medical imaging care, is an achievement that goes beyond ACR accreditation to recognize best-quality imaging practices and diagnostic care.

Among adult imaging centers, VCU Health is the only health system in Richmond to achieve DICOE designation, the only academic medical center in Virginia and one of only 16 academic medical facilities in the United States.

DICOE designation acknowledges the integral role staff, technology, policies and procedures play in providing excellent patient care in our Department and in every location. VCU Health imaging centers earning DICOE designation include the Adult Outpatient Pavilion, Stony Point 9000, Short Pump Pavilion, the Main Hospital and Gateway. These centers are also accredited by the ACR in all modalities they provide and actively participate in the Dose Index Registry® and Lung Cancer Screening, as well as the ImageWisely® and Image Gently® initiatives.



American College of Radiology accreditation achieved in all Department modalities

The VCU Department of Radiology has received nationally recognized ACR accreditation in all imaging modalities, representing the highest level of image quality and patient safety. The VCU Department of Radiology was awarded accreditation in computed tomography, mammography, stereotactic breast biopsy, magnetic resonance imaging, breast magnetic resonance imaging, ultrasound, breast ultrasound, nuclear medicine and positron emission tomography. The Department also achieved the ACR Breast Imaging Center of Excellence status.

ACR accreditation is only awarded to facilities meeting ACR Practice Parameters and Technical Standards, as per a peer-review evaluation by board-certified physicians and medical physicists. Programs are assessed on diagnostic image quality, personnel qualifications, adequacy of facility equipment, quality control procedures and quality assurance programs.

Participation in ACR registry helps ensure continued quality of lung cancer screening program

The VCU Department of Radiology participates in the American College of Radiology's Lung Cancer Screening Registry®. This registry is approved by the Centers for Medicare and Medicaid Services (CMS) to enable providers to meet quality reporting requirements for low-dose computed tomography (CT) lung cancer screening. As participants, the Department's CT physicians, technologists and nurses review quarterly reports, peer comparisons and data for individual physicians to help refine and improve lung cancer screening for patients at VCU Health.

The leaders in our Department are also recognized as leaders in their field

Congratulations to our most recent national award recipients

Our faculty and staff earn recognition every day from their patients and coworkers, but in the past two years, our team has also garnered praise from leaders in the profession, as proven by their receipt of numerous awards.

Ann S. Fulcher, M.D. was awarded the 2021 Gold Medal from the Society of Abdominal Radiology (SAR). The Gold Medal is the highest honor presented by the Society. It is awarded to individuals who have made significant and continual contributions to the field of abdominal radiology. Among Dr. Fulcher's many career accomplishments in abdominal radiology is her early pioneering work on magnetic resonance cholangiopancreatography for the noninvasive imaging and diagnosis of pancreaticobiliary disease. Today, this procedure is commonly used throughout the world.



Drs. Joel Fletcher (left) and Desiree Morgan (right) present Dr. Ann Fulcher with the SAR Gold Medal award. Photo courtesy Dr. Frank Scholz.

Mark S. Parker, M.D. was named the 2022 Distinguished Educator by the American Roentgen Ray Society (ARRS).

This award recognizes outstanding educators in the field of radiology with a track record of improving the society's educational program through innovative activities that result in improved participant competence and performance,

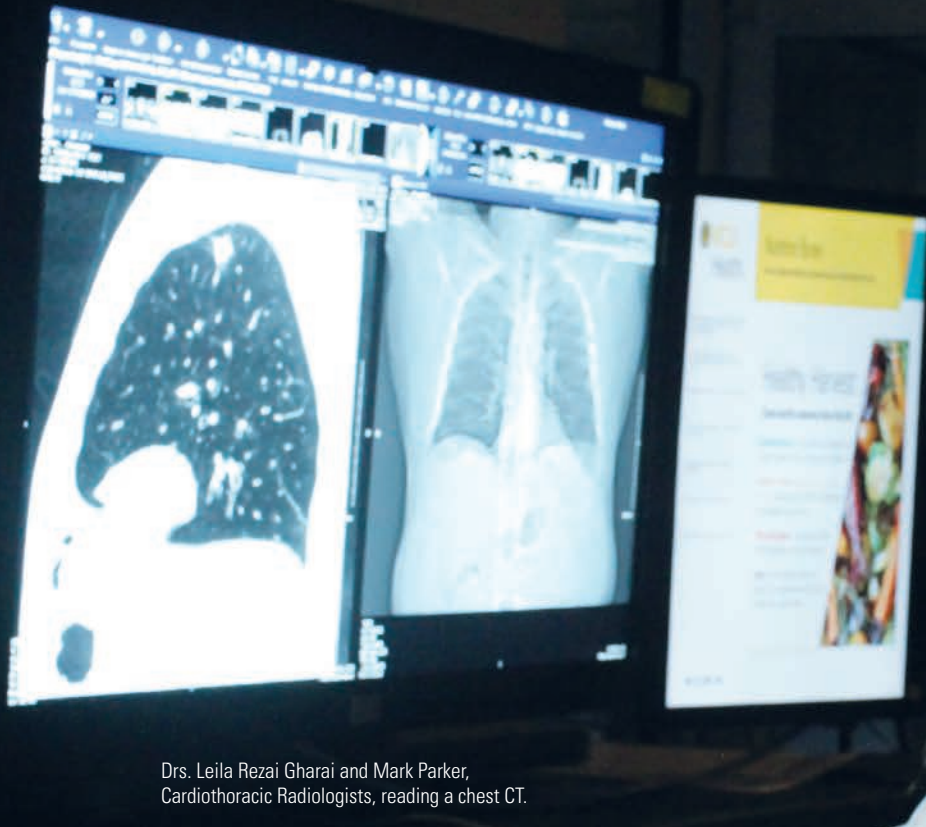
which ultimately leads to improved patient outcomes. The award goes to a single physician each year. Dr. Parker also received the **2022 Enrique Gerszten, M.D. Faculty Teaching Excellence Award**. Presented each year to a faculty member for outstanding teaching achievements, it is the highest award given in recognition for teaching excellence at the VCU School of Medicine. The award distinguishes Dr. Parker's achievements in teaching medical students, residents, fellows and colleagues at VCU, as well as at the national and international levels. To date, Dr. Parker is the only radiologist to have ever earned this prestigious VCU School of Medicine award.



Dr. Mark Parker with ARRS President, Dr. Jonathan Kruskal.

Pei-Jan Paul Lin, Ph.D. received the 2020 Outstanding Reviewer Award from the Radiological Physics and Technology journal. *Radiological Physics and Technology* is the official journal of the Japanese Society of Radiological Technology, the Japan Society of Medical Physics and the Asia-Oceania Federation of Organizations for Medical Physics. Dr. Lin was also presented with the **2022 Marvin D. Williams Professional Achievement Award** from the American Association of Physicists in Medicine.

Subspecialty expertise



Drs. Leila Rezai Gharai and Mark Parker,
Cardiothoracic Radiologists, reading a chest CT.

We provide highly trained subspecialists, including diagnostic radiologists, interventional radiologists, nuclear medicine physicians and medical physicists. Our expert imaging and intervention procedures include:

- / Advanced prostate imaging
- / Breast magnetic resonance imaging (MRI) and biopsy
- / Advanced cardiac imaging
- / Cardiovascular imaging
- / Computed tomography (CT) colonography
- / CT enterography and MR enterography
- / Emergency and trauma radiology
- / Fetal MRI
- / Lung cancer screening
- / Advanced musculoskeletal imaging techniques and interventions
- / Advanced neuroradiology
- / Specialized ultrasound and contrast-enhanced techniques
- / PET/CT and Nuclear Medicine

Our faculty teaches, researches and moves us all forward

The faculty members in our Department carry a heavy clinical load and are very active academically, from the local to the national level.

VCU Department of Radiology faculty academic activity for 2021–2023

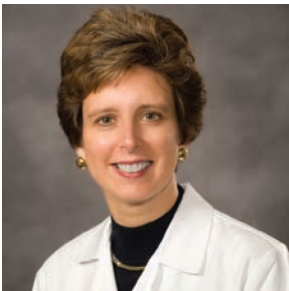
Oral presentations	138
Peer-reviewed publications	111
Exhibits	65
Educational society committee participation	50
Abstracts	33
Primary mentorships	31
Invited lecturer	30
Journal editorial work	30
Scientific program work for major societies	29
Visiting professorships	11
Book activity	10
Grants	7
Non-PMID-reviewed publications	4

VCU medical
campus in
downtown
Richmond.

Meet the VCU Department of Radiology Executive Leadership Team

The VCU Department of Radiology's Executive Committee comprises the Department's leadership. Acting as the collaboration center for the Department, the purpose of this Committee is to facilitate decision-making among operational units, and to develop and execute the strategic plan.

A story of excellence that starts at the top



**Ann S. Fulcher, M.D.,
FACR, FSAR, FSAB**

Tenured Professor
Chair, Department
of Radiology
Director, Enterprise
Wide Radiation
Safety Initiative
Director, Enterprise
Wide Imaging Safety &
Compliance Initiative



**Mary Ann Turner, M.D.,
FACR, FSAR**

Professor
Vice Chair of Faculty
Director, Gastrointestinal
and Genitourinary
Radiology



**Malcolm K. Sydnor Jr.,
M.D.**

Professor
Vice Chair, Quality
and Safety
Director, Division of
Interventional Radiology



**Sherry C. Elliott, M.B.A.,
FACMPE**

Associate Professor
Vice Chair, Administration
and Operations



**Ben Roberts, M.H.A.,
RT(R), (MR)**

Director, Radiology

The history of imaging excellence

1895 – Wilhelm Röntgen discovers the X-ray.

1896 – Henri Becquerel discovers radioactivity and Thomas Edison invented fluoroscopy.

1898 – Dr. Ennion G. Williams, who began his career in Medical College of Virginia's (MCV) Old Dominion Hospital as a radiologist, purchases a Heinz coil machine to take X-rays.

1903 – The first X-ray machine is installed at the MCV Charlotte Williams Memorial Hospital.

1916 – Dr. Alfred L. Gray, Dean of MCV, is appointed as first Chair of the Department of Radiology.

1932 – Dr. Daniel D. Talley Jr. is appointed Chair of the Department of Radiology.

1934 – Dr. Frederick B. Mandeville is appointed Chair of the Department of Radiology.

1959 – The Department of Radiology performs more than 66,000 X-ray examinations and 6,000 treatments.

1960 – A two-year course in X-ray technology is added at MCV.

1961 – Dr. Richard G. Lester is appointed Chair of the Department of Radiology. During the same year, the Department expands its capabilities with the purchase of new pieces of diagnostic and treatment equipment, including a 2-million volt Maxitron for radiotherapy.

1965 – Dr. Elmer R. King is appointed Chair of the Department of Radiology. This same year, the Board of Visitors approves three new divisions in the Radiology Department, including the Division of Diagnostic Radiology, the Division of Radiation Physics and the Division of Radiobiology. These are in addition to the Division of Radiotherapy, also headed by Dr. King. Dr. M. Pinson Neal is appointed as head of the Division of Diagnostic Radiology.

1968 – Virginia Commonwealth University is created through the merger of Richmond Professional Institute and the Medical College of Virginia.

1971 – It is reported that MCV Hospitals saw an X-ray procedure performed every four minutes, a surgical operation every 40 minutes and an emergency room admission every 10 minutes.

1972 – Dr. Klaus R. Ranniger is appointed Chair of the Department of Radiology.

1974 – The first CT scanner, a head CT scanner, is installed at MCV Hospitals.

1977 – Dr. Michael C. Beachley is appointed Chair of the Department of Radiology.

1977–1978 – The first Body CT scanner is installed at MCV Hospitals.

1978–1979 – Percutaneous Biliary Interventions are first performed by Dr. Mary Ann Turner at MCV Hospitals.

1979 – Angioplasty is first introduced at MCV Hospitals.

1982 – Dr. P.R.S. Kishore is appointed Chair of the Department of Radiology. During the same year, the Department moves from the sixth floor of West Hospital to one central location on the third floor of the new Main Hospital.

1984 – MCV Hospitals reports 184,557 annual diagnostic radiology tests completed.

1985 – The first MRI machine is installed at the hospital. A six-ton MRI magnet is hoisted through an opening in the Main 3 Hospital wall to place a powerful new diagnostic imaging unit in a specially constructed room in the Department of Radiology.

1989 – Dr. Anthony V. Proto is appointed Chair of the Department of Radiology.

1990s – First transjugular intrahepatic portosystemic shunt (TIPS) procedure is performed at VCU by Drs. Arthur Freedman, Arina Van Breda and Jaime Tisnado.

The Skull and Bones restaurant, a medical student hotspot, closes to make way for the Gateway Building, where Nuclear Medicine occupies the second floor.

1994 – MCV Women's Health Center in the Park at Stony Point opens, housing Radiology Outpatient Breast Imaging Service, and offering new patient-centric service with same-day results on mammogram testing.

1996–2000 – VCU is part of breakthrough multiple sclerosis (MS) research using Magnetic Resonance Imaging.

1998 – Dr. B.J. Manaster is appointed Chair of the Department of Radiology.

The first CT Colonography (Virtual Colonoscopy) is performed.

1999 – Dr. James L. Tatum is appointed Chair of the Department of Radiology.

2001–2002 – The Department transitions from X-ray film to digital imaging acquisition, digital files and digital reporting.

2002 – A new Positron Emission Tomography (PET) scanner is added to MCV Hospital's diagnostic imaging capabilities.

2003 – Dr. Ann S. Fulcher is appointed Chair of the Department of Radiology. The same year, Dr. Fulcher establishes the Radiology Residents' Fund to provide financial support for educational endeavors of radiology residents and trainees, including research, lectureships and professorships.

2004 – Prostate MRI Service starts under the leadership of Dr. Jinxing Yu, leading to approximately 7,000 prostate MRIs performed (as of March 2023).

Medical College of Virginia Hospitals Authority name changed to the VCU Health System.

2005 – VCU Vein Care at Stony Point is established for the minimally invasive treatment of varicose veins, work that continues today at Baird Vascular Institute. Thousands of patients have since been treated.

2005–2010 – The Department of Radiology enters a period of rapid growth, recruiting more physicians, installing all-new technology and renovating interventional radiology suites.

2006 – Institutional Review Board approval is granted to treat hepatocellular carcinoma via the catheter-directed injection of radiopharmaceuticals, a collaborative effort between Interventional Radiology and Nuclear Medicine. This marks the beginning of Interventional Oncology; thousands of patients have since undergone similar treatments.

2011 – Dr. Ann Fulcher is appointed Director of the Enterprise Wide Radiation Safety Initiative and the Clinical Radiation Safety Committee is created.

The first MRI-guided biopsy is performed at VCU Health.

The Department adds its first dual-energy CT scanner, a CT scanner on the eleventh floor of the Critical Care Hospital and two CT scanners in the Emergency Department.

2012 – VCU Health Breast Imaging converts to 3-D breast imaging capabilities and becomes an American College of Radiology (ACR) Center of Excellence.

The Department launches the first ACR-accredited multidisciplinary Early Detection Lung Cancer Screening Program in Virginia. The Lung Cancer Alliance designates the Lung Cancer Screening Program as a Screening Center of Excellence.

VCU Health receives a generous gift from the Baird family for the Department of Radiology to direct the conversion of the prior Richmond-based Virginia Heart Institute, a cardiology practice, into a multidisciplinary vascular center named VCU Health's Baird Vascular Institute.

2014 – The Division of Nuclear Medicine installs its first SPECT/CT scanner.

The first US/MRI fusion biopsy is performed at VCU Health, leading to more than 3,000 fusion prostate biopsies performed (as of March 2023).

2015 – Interventional radiologists at Baird Vascular Institute begin offering Tenex, a minimally invasive treatment using high-frequency ultrasound and mechanical disruption, to treat chronic tendon conditions and plantar fasciitis. More than 1,000 patients have since been treated.

2016 – VCU Health opens the 111,000-square-foot, five-story Neuroscience, Orthopaedic and Wellness Center (now called the Short Pump Pavilion), which features comprehensive Musculoskeletal Imaging (MSK) and Neuroradiology Services, including MRI, CT, MSK interventions, ultrasound and radiography.

The \$200 million Children's Pavilion opens in downtown Richmond as the region's largest and most advanced outpatient pediatric facility, bringing more than 170 specialists under one roof, including Pediatric Imaging Services, including MRI, CT, ultrasound and radiography.

2017 – Dr. Melvin J. Fratkan, who joined the Department in 1971, retires and continues to remain active as an emeritus faculty member.

2019 – A 3-D image-processing lab launches at VCU Health.

2020 – The Department expands to offer advanced medical imaging at the VCU Health New Kent Emergency Hospital and medical imaging services on the campus of the College of William & Mary.

2020 – VCU officially approves the Integrated and Independent Interventional Radiology Residency Programs, which have led to separate but related residency programs for Diagnostic and Interventional Radiology.

2021 – The Department launches Breast Imaging Services and the Early Detection Lung Cancer Screening Program at VCU Health Tappahannock Hospital.

The expansive 615,000-square-foot Adult Outpatient Pavilion opens offering full imaging services, including CT, MRI, ultrasound, plain films and Breast Imaging.

2022 – The VCU Health Radiology Department earns Diagnostic Imaging Center of Excellence (DICOE) designation by the American College of Radiology (ACR) for five VCU Health adult imaging center locations. VCU Health is one of only 16 academic medical centers to do so nationwide and the only medical center in Virginia.

The VCU Department of Radiology completes a \$50 million, three-year renovation project, resulting in new state-of-the-art ergonomic reading rooms, eight interventional procedure rooms and a 24-bed recovery unit in the Main 3 Hospital. The faculty offices, conference room and Residency Director Office move to the second floor of West Hospital, in adjacent wings to the Radiology Department administrative offices.

The Department performs more than 425,000 studies.

2023 – The Children's Tower at the Children's Hospital of Richmond at VCU opens, offering a full range of Pediatric Imaging Services.

List of locations with Radiology services

Downtown:

Main Hospital
Emergency Department
Gateway Building
Critical Care Hospital
North Hospital
Adult Outpatient Pavilion
Ambulatory Care Center
Children's Hospital of Richmond
Children's Outpatient Pavilion
Nelson Clinic

Remote Sites:

Stony Point
Short Pump Pavilion
Baird Vascular Institute
Emergency Center at New Kent
Colonial Heights Orthopaedics
Community Memorial Hospital
Tappahannock Hospital
Mayland Medical Center
GreenGate
Sheltering Arms Institute
VCU Sports Medicine
VCU Center for Advanced Health Management
Fredericksburg
College of William & Mary

"I've had the awesome opportunity to be cared for by the radiology teams in the North Hospital. Everyone is awesome. The empathy, courtesy, professionalism and just fun folks have made this process awesome."

- VCU Health North Hospital Patient

"Baird Vascular Institute is a top-notch facility. The whole staff is amazing."

- VCU Health Baird Vascular Institute Patient

Equipped to excel: VCU Department of Radiology equipment and technology



As new advances in radiology emerge, we stay ahead of the curve. Technology currently available at our VCU Health facilities includes:

Downtown:

Main Hospital: Two hybrid diagnostic/fluoroscopy rooms, two diagnostic rooms, three general ultrasound rooms, three interventional ultrasound suites, one interventional CT, four diagnostic interventional suites, one hybrid CT/diagnostic interventional suite, one multispecialty interventional room, one diagnostic CT

Emergency Department: Two CTs and two diagnostic rooms

Gateway: Two 1.5T and two 3.0T MRIs, one CT, one PET scanner and four nuclear medicine cameras

Critical Care Hospital: One CT

North Hospital: One 3.0T cardiac MRI

Adult Outpatient Pavilion: One MRI, one CT, two ultrasound rooms, four diagnostic radiology rooms, two therapeutic/diagnostic injection rooms and comprehensive Breast Imaging that includes three diagnostic/screening Breast Imaging rooms, one diagnostic/procedural Breast Imaging room, ultrasound and access to MRI

Ambulatory Care Center: One diagnostic room

Children's Hospital of Richmond (CHoR): One MRI, one CT, one diagnostic room

Children's Outpatient Pavilion: Two hybrid diagnostic/fluoroscopy rooms, three ultrasound rooms, one CT, one MRI, one diagnostic ultrasound, one C-arm and one EOS (scoliosis X-ray)—the only one in Richmond

Nelson Clinic: Inpatient Breast Imaging

Remote Sites:

Stony Point 9000: One MRI, one CT, three diagnostic radiology rooms, one therapeutic/diagnostic injection room, two ultrasound rooms, and comprehensive Breast Imaging capabilities that include three diagnostic/screening Breast Imaging rooms, one diagnostic/procedural Breast Imaging room, ultrasound and access to MRI

Short Pump Pavilion: One MRI, one CT, four diagnostic radiology rooms, one therapeutic/diagnostic injection room, one ultrasound room

Baird Vascular Institute: Fluoroscopy procedure room, ultrasound procedure room, three recovery bays, three clinic rooms and vascular ultrasound room

Emergency Center at New Kent: One CT, one ultrasound room, one diagnostic radiology room

Colonial Heights Orthopaedics (Southpark and Jennick locations): Three diagnostic rooms, two therapeutic/diagnostic injection rooms

Community Memorial Hospital: One CT, one MRI, two hybrid diagnostic/fluoroscopy rooms, Breast Imaging, ultrasound

Tappahannock Hospital: Two hybrid diagnostic/fluoroscopy rooms, two ultrasound rooms, one Breast Imaging room, one diagnostic CT, one MRI, one mobile PET/CT

Mayland Medical Center: One diagnostic room

GreenGate: One screening Breast Imaging room

Sheltering Arms Institute: One hybrid diagnostic/fluoroscopy room, one ultrasound room

VCU Sports Medicine: One diagnostic room

VCU Center for Advanced Health Management: One diagnostic room

Fredericksburg: One diagnostic room, one ultrasound room

College of William & Mary: One ultrasound room, one diagnostic room



The VCU Health Main 3 Hospital renovation creates new space for new advancements

The recent renovation of VCU Health Main 3 Hospital took the VCU Department of Radiology's capabilities to new heights. This \$50 million, three-year project created a newly re-imagined space for Radiology, which now includes:

- / Eight interventional suites including a hybrid room with fluoroscopy and CT capability
- / A 24-bed prep and recovery space
- / Spacious state-of-the-art ergonomic reading rooms
- / Expanded Image Resource Center space
- / An updated Main 3 Hospital Radiology patient registration area
- / A state-of-the-art conference center in West Hospital for resident and medical student education
- / Two CT scanners
- / Two fluoroscopy rooms
- / Three diagnostic rooms
- / Four ultrasound rooms
- / A therapeutic/diagnostic injection room

The project creates a new "home base" for the Department, with a solid infrastructure that facilitates the highest level of safety and patient care.



Our Department at a glance

By the numbers: The Department team 2021–2022

The VCU Department
of Radiology
currently includes:

51

Radiologists

38

Residents

6

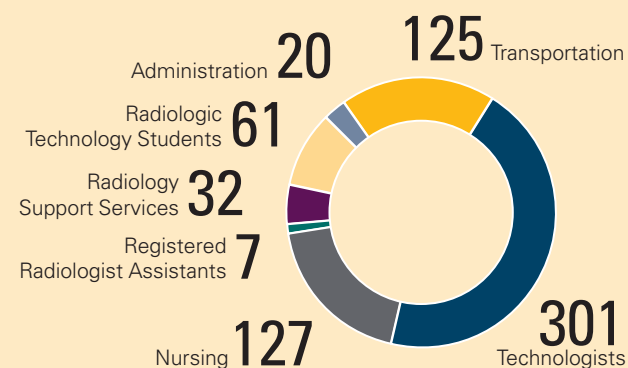
Fellows

5

Physicists

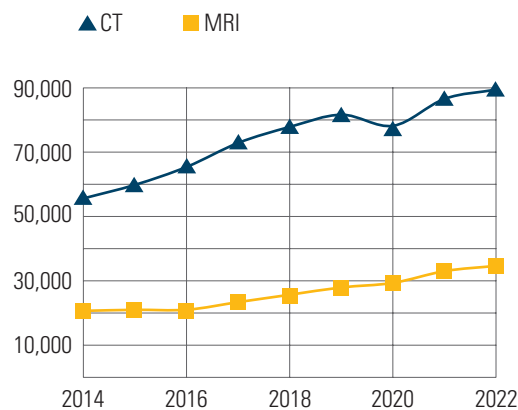
773

Total employees



By the numbers: imaging volume 2014–2022

CT and MRI volume from
2014–2022



Imaging volume by modality 2014–2022

Modality	Total by Fiscal Year								
	2014	2015	2016	2017	2018	2019	2020	2021	2022
Conventional Imaging	178,403	182,647	189,378	206,508	217,185	214,016	201,684	210,377	217,016
CT	55,770	59,981	65,533	72,954	77,891	81,630	78,211	86,565	89,413
MRI	20,681	21,001	21,032	23,428	25,734	28,019	29,444	33,137	34,773
US	17,167	18,295	19,463	21,409	22,492	24,000	21,879	23,766	25,225
Nuclear Medicine/PET	8,743	7,760	7,043	6,955	7,283	7,753	7,260	7,471	7,597
IR	16,257	15,466	13,745	14,895	15,294	16,265	18,786	17,753	20,364
Breast Imaging	32,547	31,477	34,279	27,948	19,807	23,155	23,175	29,358	31,434
Total	329,568	336,627	350,473	374,097	385,686	394,838	380,439	408,427	425,822

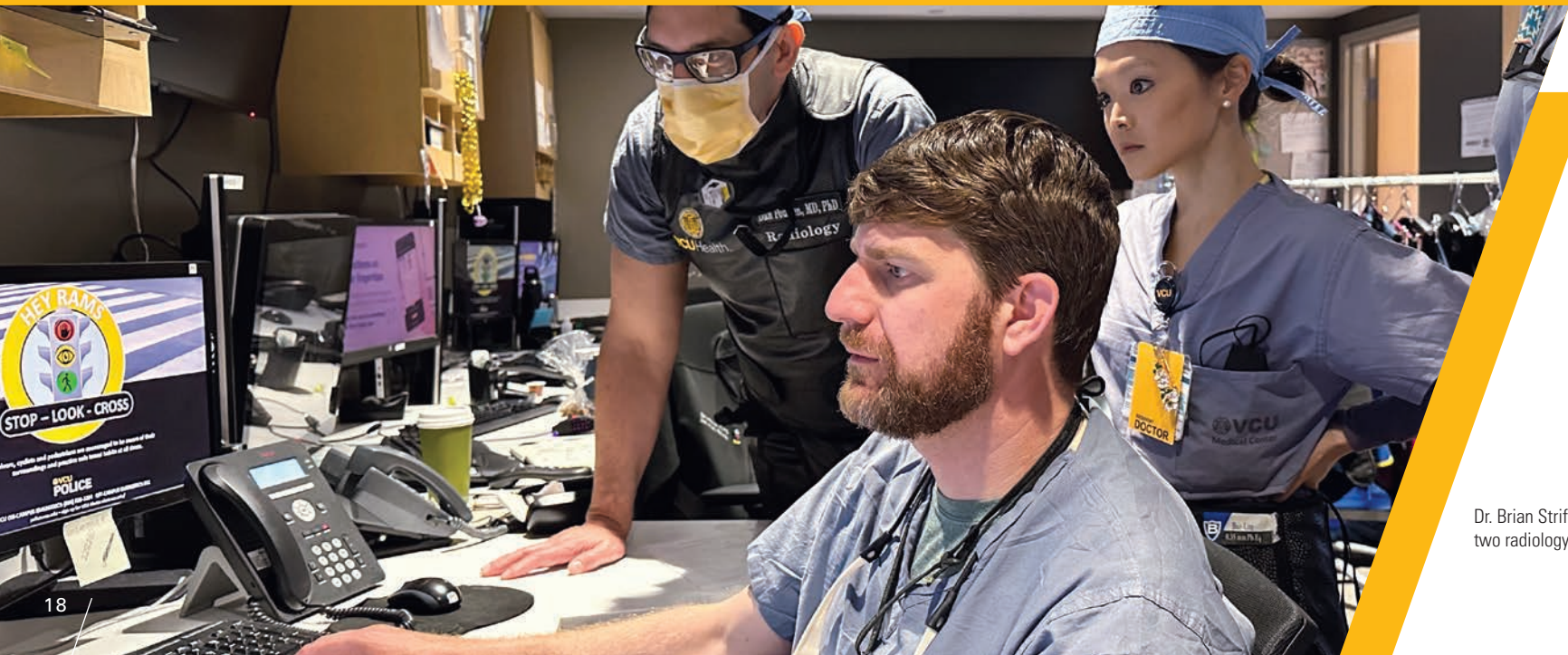
As needs change, our strengths evolve

The Department's framework: an overview of Divisions and subspecialty Sections

Over the years, the VCU Department of Radiology has evolved to meet the needs of faculty, trainees and patients. Today, our organizational framework consists of four Divisions with seven subspecialty Sections and more than 50 faculty radiologists and nuclear medicine physicians.

Our Divisions and subspecialty Sections enhance strategic decision-making capabilities and advanced-specialized training. This structure further improves our ability to identify, recruit and promote talented faculty to meet the requirements of an ever-changing health care environment.

Here, our expertise ranges from Interventional and Non-Interventional Radiology to Nuclear Medicine and Neuroradiology with interpretation of the full range of imaging studies including CT, MRI and ultrasound. Our faculty and staff provide comprehensive, high-quality, subspecialized care that rivals other academic medical centers.



Dr. Brian Strife teaching two radiology residents.

The VCU Department of Radiology's Divisions and Division Chairs:

Diagnostic Radiology



Mary Ann Turner, M.D., FACR, FSAR

Professor
Vice Chair, Department of Radiology
Chair, Diagnostic Radiology
Director, Gastrointestinal and Genitourinary Radiology

The Division of Diagnostic Radiology plays a central role in clinical decision-making in medicine and radiology education. Diagnostic Radiology uses X-ray, fluoroscopy, CT, MRI and ultrasound to provide diagnostic evaluation and therapeutic interventions to diagnose and treat disease, illness and injury.

Interventional Radiology

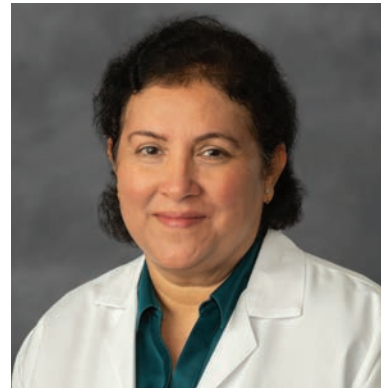


Malcolm K. Sydnor Jr., M.D.

Professor
Vice Chair, Quality and Safety
Chair, Division of Interventional Radiology

The Division of Interventional Radiology carries out minimally invasive procedures using imaging guidance with X-ray, CT and ultrasound. The minimally invasive procedures offered by interventional radiology have less risk, less pain and less recovery time compared to open surgery.

Nuclear Medicine



Jayashree Parekh, M.D., M.B.A.

Associate Professor
Chair, Division of Nuclear Medicine

The Division of Nuclear Medicine uses small amounts of injected, ingested or inhaled radioactive materials called radiopharmaceuticals or radiotracers to diagnose disease and other abnormalities. Our Nuclear Medicine physicians use an external scanning device or specialized camera to detect the radioactive material and produce images to provide information on organ function and cellular activity.

Diagnostic Medical Physics



Pei-Jan Paul Lin, Ph.D.

Professor
Chair, Division of Diagnostic Medical Physics
Chief Medical Physicist, VCU Health

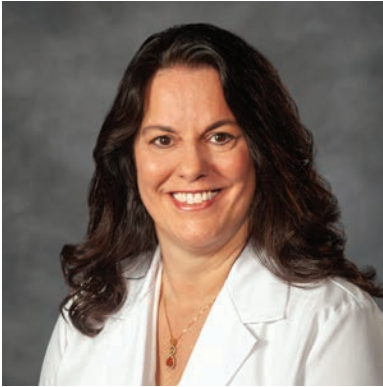
The Division of Diagnostic Medical Physics conducts a full range of diagnostic medical physics activities, including quality assurance, patient dosimetry, shielding designs and protocol development to ensure the safety of our patients and staff.

The Sections within the Division of Diagnostic Radiology

Sections

- / Abdominal Imaging
- / Breast Imaging
- / Cardiothoracic Imaging
- / Emergency Radiology
- / Musculoskeletal Imaging and Intervention
- / Neuroradiology
- / Pediatric Imaging

Abdominal Imaging



Laura R. Carucci, M.D., FACR, FSAR

Tenured Professor
Section Chief, Abdominal Imaging
Director, Abdominal MRI
Director, Computed Tomography
Director, MRI

Abdominal Imaging provides diagnostic medical imaging and therapeutic interventions to diagnose and treat diseases and conditions of the abdominal and pelvic regions. As one of the largest abdominal imaging sections in the country, we are recognized nationally for our expertise in advanced imaging of the gastrointestinal tract and genitourinary system and advanced prostate imaging and intervention.

“Our Abdominal Imaging program is a crown jewel. We have a partnership with radiology that provides in-house volume, vascular and biliary imaging on prospective donors that most programs send out for commercial service at a considerable expense (with inferior results). Outside of living donors, the radiologists’ reads on our TPIAT, kidney, liver and hepatobiliary patients are second to none—they are the best that I have ever seen.”



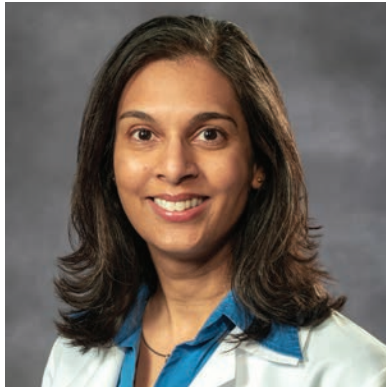
– David Bruno, M.D., FACS
Interim Chair, Division of
Transplant Surgery
Surgical Director of Adult
and Pediatric Liver Transplantation
VCU Department of Surgery

Recent faculty achievements in abdominal imaging

Laura Carucci, M.D. and **Neeraj Lalwani, M.D.** each earned the Radiology Society of North America’s *RadioGraphics* Editor’s 2022 Recognition Award for Reviewing with Distinction. The award is presented annually to a highly select group of reviewers.



Breast Imaging



Priti A. Shah, M.D.

Assistant Professor
Section Chief, Breast Imaging
Director, Breast Imaging

Breast Imaging provides patients with personalized, high-quality breast health evaluations. We are part of a multidisciplinary team at the VCU Massey Cancer Center that includes pathologists, surgical oncologists, medical oncologists, radiation oncologists, plastic surgeons, nurses and geneticists—all with special training in breast cancer. Our team offers patient-centric care with rapid feedback of results and facilitated, integrated patient care.

Outstanding capabilities lead to Center of Excellence accreditation in Breast Imaging

The VCU Department of Radiology was the first facility in Virginia to receive American College of Radiology accreditation for breast MRI, and the first facility in Richmond, Virginia, to earn American College of Radiology (ACR) Breast Imaging Center of Excellence designation.

In 2021 and in 2023, the Breast Imaging Section experienced considerable growth with the hiring of two alumni of our residency and Breast Imaging fellowship programs. There are now five faculty members with breast imaging expertise. The Section is supported by a Breast Imaging nurse navigator, who is responsible for assessing and removing barriers to patient care while also advocating for the patient throughout their journey.

The VCU Department of Radiology has been proactive in consistently upgrading breast imaging equipment. The mammography units at all VCU Health Breast Imaging Centers are equipped with the latest 3-D technology.

In July 2021, the Department also began supporting Breast Imaging Services at the VCU Health Tappahannock Hospital, and concurrently passed the annual FDA inspection for Nelson Clinic, Stony Point 9000 and Tappahannock Hospital.

In 2022, the VCU Medical Center outpatient Breast Imaging Clinic moved from Nelson Clinic to the spacious sixth floor of the new Adult Outpatient Pavilion. This modern space is larger and is outfitted with additional technology, including two ultrasound units and three 3-D mammography units.

Within weeks of opening to patients at the Adult Outpatient Pavilion, the Breast Imaging Section earned ACR accreditation for:

- / Three mammography units
- / Breast ultrasound, including diagnostic ultrasound biopsy and fine needle aspiration (FNA)
- / Stereotactic biopsy

With these accreditations, and after rigorous review, the Department further achieved Breast Imaging Center of Excellence status.

The Department's strategy to broaden access and improve outcomes for patients continues to be sustained through strategic partnerships. Recently, we established a partnership with VCU Health Women's Health to offer screening mammography, along with OB-GYN services, at the VCU Health at GreenGate facility located in Richmond's Short Pump area. The Department also made a commitment to provide mammography services to the Virginia Department of Health's Every Woman's Life program. This public health program helps uninsured and low-income women gain access to free clinical breast exams, mammograms and cervical cancer screening.

The VCU Department of Radiology's Breast Imaging Section actively collaborated with the VCU Massey Cancer Center on the Plan, Do, Study, Act Quality Improvement Project for a post-COVID-19 pandemic return-to-screening assessment. At the conclusion of the project, the team determined that during re-activation efforts, a majority of patients returned to breast cancer screening due, in large part, to well-trained schedulers who guided patients to reschedule appointments instead of cancelling their life-saving screenings.



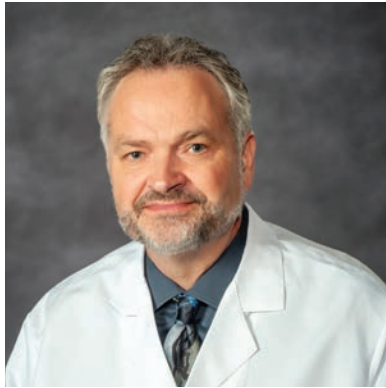
"The Breast Imaging Services at VCU Health make an enormous impact on patient care for those diagnosed with breast cancer. The ability to provide high-quality, leading-edge imaging to our patients allows the cancer treatment team to make decisions regarding surgery, systemic therapy and radiation.

Patients at high risk for breast cancer require a team approach to care. Our Breast Imaging Service is an integral part of this team, offering high-quality screening with digital mammography and MRI for patients at highest risk. Their partnership in treating our at-risk patients has likely prevented poor outcomes for women seeking care at VCU Massey Cancer Center. Partnering with our breast imagers, we are pleased to retain so many of our patients in survivorship. Their care in determining the best screening protocols for our patients allows survivors to know that they are receiving the most data-driven and compassionate care in the region."



– Kandace P. McGuire, M.D., FACS
Professor of Surgery
Chief of Breast Surgery
VCU Massey Cancer Center

Cardiothoracic Imaging



Mark S. Parker, M.D., F.A.C.R.

Professor of Diagnostic Radiology and Internal Medicine
Co-Section Chief,
Cardiothoracic Imaging
Director, Lung Cancer Screening Program

Cardiothoracic Imaging specializes in the diagnosis of diseases and disorders of the lungs, mediastinum, airway, pleura and chest wall, and heart including myocardium and coronary arteries. The Section established and leads a nationally recognized Lung Cancer Screening Program, and offers advanced imaging such as high-resolution CT for interstitial lung disease, as well as advanced cardiac imaging including coronary CTA and cardiac MRI.



John D. Grizzard, M.D.

Associate Professor
Co-Section Chief,
Cardiothoracic Imaging
Director, Noninvasive Cardiovascular Imaging

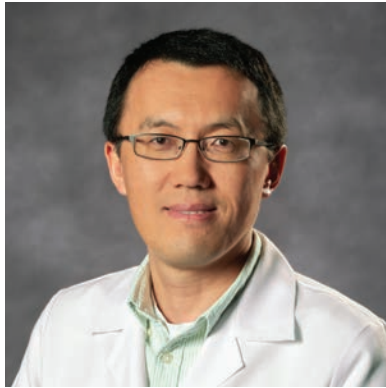
"As a pulmonary and critical care medicine physician, I find there is little of my practice that is not impacted in some way by my radiology colleagues. By necessity, we have the tightest relationship with the thoracic radiology section, depending on their expertise in assisting in everything from lung cancer to complex interstitial lung disease. They are also an important part of the education of our fellows."

In the ICU, I would be remiss not to call out the collaborative relationship with the equally talented interventional radiology group. I doubt a week goes by without us reaching out to them for some technically difficult, often lifesaving procedure. Both of these groups are notable not just for their 'pure radiology' skills, but also for their ability and willingness to discuss cases face to face and to integrate key clinical information."



– Lisa K. Brath, M.D., FCCP
Professor of Medicine
Program Director, Pulmonary & Critical Care Medicine Fellowship
Medical Director, Respiratory Care Services
Medical Director, Unique Pathogens Unit

Emergency Radiology



Yang Tang, M.D., Ph.D.

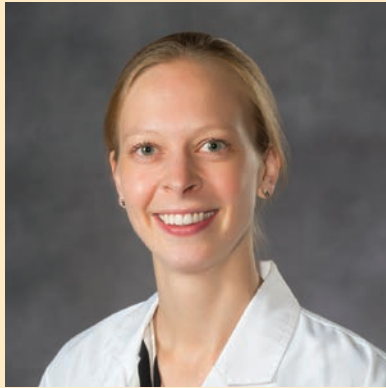
Associate Professor
Section Chief, Emergency Radiology
Co-Director, Quality Assurance for Diagnostic Radiology
Radiology Liaison for the Comprehensive Stroke Center

Emergency Radiology is one of our most active clinical and academic services. With two dedicated Emergency Department CT scanners and access to MRI, diagnostic services and ultrasound, our radiologists are responsible for the 24/7/365 interpretation of emergency imaging at VCU Health, its affiliated Level 1 Trauma Center and the Comprehensive Stroke Center.

"Imaging services are extremely important to the care of emergency patients. We are extremely fortunate to have a very strong and collaborative relationship with the Department of Radiology that allows us to problem solve and to bring creative solutions to bear. The normal ED imaging volume combined with the stroke alerts and trauma patients has significantly increased the workload on imaging, and together we have worked through numerous barriers to bring timely care to our patients. Another example is the Pulmonary Embolus Response Team (PERT), in which interventional radiology has worked with us and others to set up a system of rapid evaluation and intervention for patients with massive PEs. This program has optimized outcomes and saved many lives. Programs such as this are only possible through the development of collaborative and trusting relationships."



– Harinder S. Dhindsa,
M.D., M.P.H., M.B.A., C.P.E.
Chair, Department of
Emergency Medicine
Director, Division of EMS
Medical Director, VCU Critical
Care Transport



Musculoskeletal Imaging and Intervention

Josephina A. Vossen, M.D., Ph.D.

Associate Professor
Section Chief, Musculoskeletal Imaging and Intervention
Director, Residency Education
Associate Director, Integrated Interventional Radiology
Residency Program
Medical Director, MSK, Stony Point Radiology

The Section of Musculoskeletal Imaging and Intervention diagnoses and treats patients who are experiencing a wide variety of musculoskeletal conditions, including injury, inflammatory arthritis, orthopaedic tumors and sports-related conditions. CT, MRI, plain films and ultrasound are used to diagnose a wide range of bone and joint conditions. Image-guided interventions for pain control and diagnoses are also performed by this Section downtown and at multiple outpatient locations.

Neuroradiology



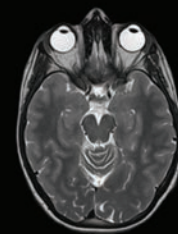
Ahmet Baykal, M.D., Ph.D.

Assistant Professor
Section Chief, Neuroradiology

Neuroradiology uses CT, MRI, perfusion imaging, and MR spectroscopy to diagnose abnormalities of the brain, head, neck, and spine. Our radiologists also perform image-guided procedures for diagnostic purposes including lumbar punctures under fluoroscopic or CT guidance, CT-guided cervical punctures, myelograms, and cisternograms. In addition, the Section provides high volume CSF drainage for the treatment of idiopathic intracranial hypertension and CT- or fluoroscopic-guided cervical or lumbar punctures with administration of intrathecal Spinraza® for the treatment of spinal muscular atrophy.



Axial head MRI.



Pediatric Imaging



Jacqueline Urbine, M.D.

Associate Professor
Section Chief, Pediatric Imaging
Director, Pediatric Imaging

The Pediatric Imaging Section provides a full range of imaging services for newborns, infants and children of all ages (up to age 18). Fetal imaging is also a part of this specialty.

Top talent and the latest technology for the next generation

The Pediatric Imaging Section services include:

- / Computed tomography
- / Fluoroscopy
- / Magnetic resonance imaging
- / Ultrasound

The Pediatric Imaging Section is a vital resource for families in the Commonwealth, and our team has set important goals for the future of pediatric imaging, with:

- / A full-service inpatient and outpatient pediatric imaging facility
- / Pediatric Imaging embedded in the care team
- / A premier pediatric radiology training program in Central Virginia

The Pediatric Imaging Section has been operating an outpatient imaging facility at the Children's Pavilion of the Children's Hospital of Richmond at VCU. The Section also staffs emergency and inpatient imaging at VCU Health and manages pediatric imaging at the Emergency Center at New Kent, Stony Point and Fredericksburg. The freestanding Children's Tower at Children's Hospital of Richmond at VCU opened in April 2023, and offers imaging customized to the needs of children, such as child-friendly MRI suites and family support options.

As the demand for pediatric medical imaging services has increased, the Department of Radiology sought to meet the current and future needs of the community by hiring two additional full-time pediatric radiologists, for a total of five radiologists. Our pediatric radiologists, along with imaging technologists, play an invaluable role in the care of our pediatric patients.



"Our kids are at the center of every decision we make and all that we do at Children's Hospital of Richmond. Our partners in radiology have been steadfast in their support, partnership and advocacy for the safest and most kid-friendly imaging services. From a shared vision of key service modalities needed for today—and planned for tomorrow—our partners in radiology have helped position CHoR and our families for a very bright future."



– Elias Neujahr,
M.H.A., M.B.A.
President
Children's Hospital
of Richmond at VCU



In Interventional Radiology, imaging is part of minimally invasive treatments



Interventional Radiology is a rapidly evolving subspecialty of radiology that conducts minimally invasive, image-guided procedures to diagnose and treat diseases in nearly every organ system of the body. Our Interventional Radiology physicians see patients and perform procedures at the downtown VCU Medical Center as well as at the VCU Health Baird Vascular Institute. There are now seven full-time interventional radiologists at VCU Health.

The recent renovation of the Department of Radiology at the VCU Medical Center allows for even more advancement in this field. Among the improvements are five new interventional fluoroscopy suites, one of which is a multimodality room with a modern CT scanner such that a patient on the same table can be imaged with fluoroscopy or CT. There are also two ultrasound procedure rooms, an additional CT procedure room, and a new 24-bed recovery area. As many as 40 or more cases are performed each day at the downtown medical campus alone, including many highly complicated cases.

VCU Health Baird Vascular Institute has four clinic rooms, a vascular lab and two procedure rooms. Patients are seen for a variety of reasons, including leg pain resulting from arterial or venous disease, portacath placements and the treatment of varicose veins.

The Division is also expanding our pediatric care with the addition of two new interventional radiology suites at the new Children's Hospital of Richmond at VCU.

Our Interventional Radiology physicians, along with surgeons, radiation oncologists, hepatologists and pathologists, see patients from the weekly multidisciplinary hepatocellular carcinoma (HCC) clinic and in the quarterly vascular malformations clinic. The success of these clinics relies on the subspecialty expertise available at VCU Health and especially within the Division of Interventional Radiology.

Our Interventional Radiology physicians are involved in research and innovation. One of the more exciting recent developments is the creation of a percutaneous dialysis access program, where the dialysis fistula is created and maintained by minimally invasive interventional radiology procedures rather than surgery.

Recent faculty achievements in interventional radiology

Brian Strife, M.D. was honored as a Shining Knight by the VCU Health Trauma Center at the 14th Annual Shining Knight Gala on Saturday, May 20, 2023, at the Greater Richmond Convention Center. At this year's gala, Dr. Strife and other Shining Knights were recognized for their roles in saving the life of one specific trauma patient. Net proceeds from the event benefit injury and violence prevention programs at and throughout the VCU Medical Center.

Brian Strife, M.D. received the 2022 Outstanding Teaching Award from the VCU School of Medicine for the "Highest Evaluation in an M3 Clerkship" for the Ambulatory Clerkship.

Christopher Bailey, D.O. received the 2022 Outstanding Teaching Award from the VCU School of Medicine for his exceptional teaching efforts in the Ambulatory Clerkship attended by medical students at the VCU Health Baird Vascular Institute.

"Essentially, transplant programs thrive or diminish based on the radiology services that are available. It is no exaggeration to suggest that the radiology services at VCU are a main contributor to the growth of our liver, kidney and living donor programs. Because of the expertise of our Interventional Radiology group and Abdominal Imaging group, the HCC care at VCU is unrivaled in this nation.

Moreover, our Interventional Radiology staff is always willing to help with complex vascular and biliary complications. They have a skill set that can be found in very few institutions in the U.S. Furthermore, they are completely service oriented. Without fail they are professional, collegial and capable—this is exactly the care that patients with high-stakes, high-morbidity, and high-mortality conditions deserve. This care is delivered at all hours and at a consistently superior level."



– David Bruno, M.D., FACS
Interim Chair, Division of Transplant Surgery
Surgical Director of Adult and Pediatric
Liver Transplantation
VCU Department of Surgery

In the Nuclear Medicine Division, new techniques become our techniques

The Division of Nuclear Medicine performs the full range of commonly used Nuclear Medicine examinations as well as more recently introduced cutting-edge diagnostic and therapeutic studies. This Division has three specialty-trained faculty members who perform Nuclear Medicine studies and positron emission tomography (PET) imaging in adults and children.

Cardiac myocardial perfusion imaging studies, cardiac amyloidosis and sarcoidosis imaging continue to show an increase in exam volume. Our high-volume PET/CT imaging program performs F-fluorodeoxyglucose (FDG) PET/CT studies for oncology indications, and has recently started conducting infection evaluations in cardiac devices. Nuclear Medicine has seen FDA approval of new imaging agents for prostate cancer and breast cancer, which we have introduced at VCU Health.

Since early 2022, we have performed more than 160 prostate-specific membrane antigen (PSMA) PET/CT studies for the targeted treatment of metastatic prostate cancer.

The Division of Nuclear Medicine also has a very active Thyroid Clinic, which provides radioactive iodine therapy to patients with thyroid disease, and we also perform radium therapy for bone metastases from prostate cancer.

Other studies our Nuclear Medicine specialists conduct include:

- / Lymphoscintigraphy for melanomas and breast cancer
- / Brain perfusion studies for the evaluation of seizure focus
- / Brain PET studies for dementia
- / 3-D lung perfusion quantitation for patients with COPD as a workup for pulmonary valve placement

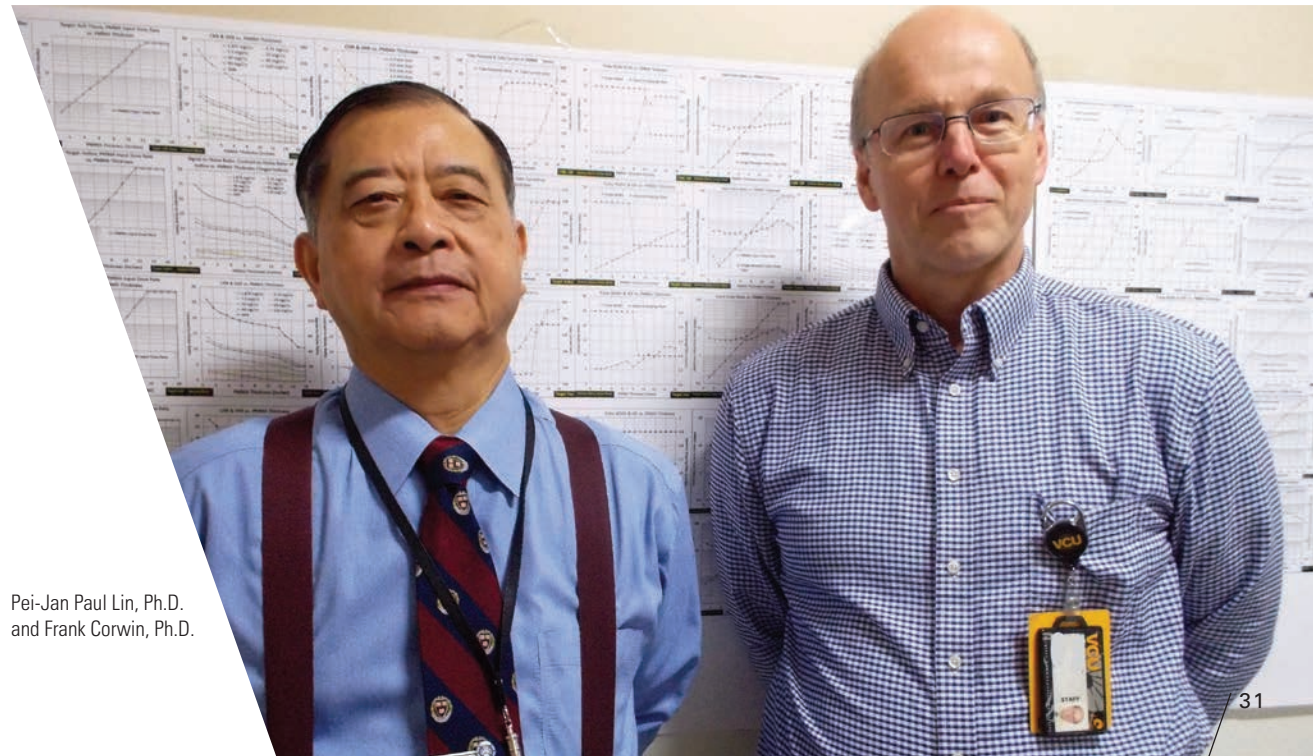


The expertise of the Division of Diagnostic Medical Physics is crucial to the safe expansion of imaging capabilities in new VCU Health facilities. The team verified the lead shielding and safe installation and functioning of imaging equipment at all new VCU Health sites including the Adult Outpatient Pavilion, the Department's new Interventional Radiology suites, and the Children's Tower at the Children's Hospital of Richmond at VCU.

Specifically, our physicists evaluate and accept all new imaging systems, which is an ongoing process as VCU Health continues to introduce new systems. The Division provided training to more than 35 Radiation Oncology team members on MRI safety processes and facilitated simulation sessions to identify clinical workflows prior to going live with the treatment of the first patient in the new Adult Outpatient Pavilion. The Division also takes the lead in annual equipment evaluations and the ongoing American College of Radiology accreditation process of VCU Health's MRI, CT and mammography services.

In addition to clinical safety evaluations and the demands of location and services expansions, this Division supports the VCU Department of Radiology's mission of education and research. Our medical physicists actively participate in the education of future medical physicists, resident physicians, medical students and technologists with respect to medical physics, radiation protection and radiobiology. Faculty members also provide hands-on clinical rotations, inspiring students to continue studies in medical physics.

The Division of Diagnostic Medical Physics works to establish the highest level of safety and compliance for radiology activities throughout the VCU Health System



Pei-Jan Paul Lin, Ph.D.
and Frank Corwin, Ph.D.



Registered radiologist assistants enhance patient care at VCU Health

Radiology clinical staff are a key to collaborative care

Radiology is an essential aspect of modern medicine, and collaboration between radiology team members and radiologists is essential for delivering efficient and safe patient care.

Radiology team members, including radiologic technologists, sonographers and radiology nurses, perform a wide range of tasks such as preparing patients for imaging procedures, administering contrast agents and ensuring the imaging equipment functions correctly.

One of the primary concerns for the entire radiology team is the safety of patients and staff members. They apply the principles of ALARA (as low as reasonably achievable) to minimize exposure to radiation. These principles aim to reduce unnecessary radiation exposure by using the lowest possible dose of radiation needed to obtain the required image quality and maintaining patient and staff safety.

Additionally, radiology team members assume responsibility for meticulously addressing individualized patient needs. They ensure that patients are well informed about the imaging procedures, and questions or concerns are addressed. Radiology team members work closely with the radiologists to determine the most appropriate imaging modality for each patient, taking into account their individual medical history and any specific concerns.

Radiology team members also play a crucial role in managing electronic imaging orders and patient health information. They are responsible for maintaining accurate and up-to-date electronic health records for each patient and that the imaging orders are appropriately documented and processed.

VCU Health employs one of the largest groups of registered radiologist assistants on the East Coast, with seven full-time registered radiologist assistants.

A registered radiologist assistant is a specially trained radiologic technologist who performs procedures under the direct supervision of a radiologist and is the equivalent to a Physician's Assistant (PA) in radiology. By working together, the medical team expedites procedures and allows time for dictation of other more complex procedures.

Registered radiologist assistants are specially trained to perform procedures in various subspecialties of radiology, including computed tomography, ultrasound, fluoroscopy, pediatric imaging, interventional oncology, and musculoskeletal intervention and imaging. They act as an extension of the radiologist, often assisting technologists and conducting some training of radiology residents.

Quality imaging and therapeutic procedures

We provide the highest standard of patient care, innovative procedures and a range of exciting clinical and technological initiatives. We demonstrate commitment to quality through:

- / Leadership in patient safety and quality
- / High-level patient and referring physician satisfaction
- / Cutting-edge procedures
- / National accreditation of imaging services



We're leading the way with innovations in imaging

New imaging techniques bring new possibilities to the patients we serve

As VCU Health relentlessly commits to discovery and innovation, and so too does our Department. Through a series of strategic expansions, the VCU Department of Radiology makes medical advancements a reality with cutting-edge technology and clinical expertise, including:

- / Advanced Prostate Imaging and Biopsy
- / Breast MRI
- / Cardiac MRI
- / CT and MR Enterography
- / Fetal MRI
- / Interventional Oncology
- / Lung Cancer Screening
- / Percutaneous Dialysis Access Creation
- / Prostate Interventions
- / Virtual (CT) Colonography

Dr. Jinxing Yu, Director of
Oncologic and Prostate Imaging.



Advanced Prostate Imaging and Intervention: the talent and technology for accurate imaging

The VCU Department of Radiology's Advanced Prostate Imaging team, under the leadership of Jinxing Yu, M.D., uses multiple noninvasive advanced prostate Magnetic Resonance (MRI) imaging techniques to detect cancers and other conditions. It is one of the largest prostate MRI and MRI-guided biopsy for prostate cancer programs on the East Coast. Our dedicated team includes genitourinary radiologists, MRI technologists, a prostate imaging coordinator, a nurse practitioner, ultrasound technologists and a procedure room assistant. Our genitourinary radiologists are specialty trained to interpret prostate MRIs and to perform MRI-targeted biopsies, which is unique in both Virginia and the United States. Patients are referred to our Advanced Prostate Imaging team from across the U.S.

Our Advanced Prostate Imaging team conducted:

770

prostate
MRI studies
in 2022

300

ultrasound/MRI
fusion-guided prostate
biopsies per year

7,000

prostate MRIs
performed since 2011

3,000

ultrasound/MRI fusion
prostate biopsies since 2014

"I had an MRI of my prostate this morning. It went very smoothly and I was thoroughly impressed with the professionalism demonstrated by the staff with their sincere effort to make me comfortable with a procedure that I'd been anxious about having. I thanked them for that and I can say they all seem truly patient-oriented which you don't always see today as medicine becomes more production oriented."

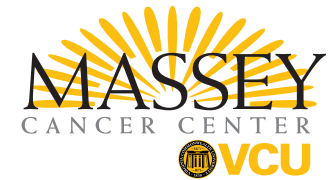
– VCU Health Patient

Oncological interventions fight cancer through image-guided therapy

Our Interventional Radiology physicians have been leaders in the growing field of interventional oncology. Interventional radiologists use advanced imaging techniques to treat cancers by performing minimally invasive procedures, thus avoiding surgery, but with equal or better outcomes and much shorter recovery times.

Interventional oncology procedures include chemoembolization, radioembolization and radiofrequency ablation. These treatments are used to treat both primary liver cancer and cancers that have metastasized to the liver. By using image guidance to place a small catheter in the arteries in the liver supplying the tumor, beads laced with radiation or chemotherapy are injected into the area of the tumor to destroy the tumor and keep it from growing. This treatment is highly successful, and patients typically go home the same day of treatment. Radiofrequency ablation is used to treat tumors of the liver or kidney. With the use of image guidance, a probe is placed into the tumor, which destroys it.

Our Interventional Radiology physicians support the care and treatment of cancer patients in many other ways by performing minimally invasive procedures, including preoperative embolization of highly vascular tumors to reduce bleeding during subsequent surgery, and for placement of feeding tubes, placement of drainage catheters in organs that are obstructed or infected, the injection of cement into the spine to stabilize and reduce pain in cancer patients, and the administration of various nerve blocks to reduce pain. Interventional Radiology also places most of the ports and other access catheters that cancer patients need for intravenous treatments, blood draws and internal biopsies.



"The Interventional Radiology team is responsive and at times creative. It is easy to get central lines placed in a timely manner for chemotherapy. They have been thoughtful about approaches to challenging liver disease (metastatic cancer). More than one patient has benefited from procedures to abate the cancer.

Interventional radiology supports cancer care with access to directed therapies (liver ablation, kyphoplasty). Line placement may not seem as important but the ability to have good IV access has allowed for more effective treatments for multiple cancers with less stress and discomfort for the patients."



– Mary Helen Hackney
M.D., M.S., FACP, Professor, Director of Community Oncology, Director of Quality Control and Safety, Division of Hematology, Oncology and Palliative Care, Department of Internal Medicine, Virginia Commonwealth University School of Medicine; VCU Massey Cancer Center

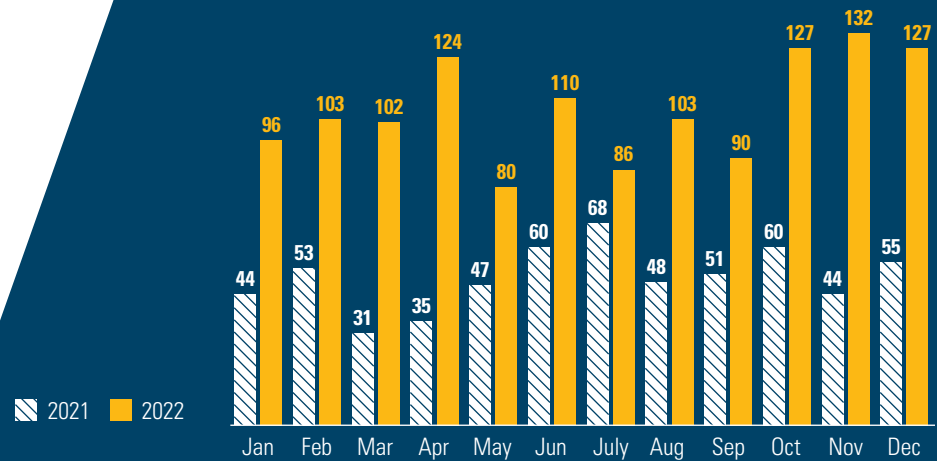
A first for Virginia: the VCU Department of Radiology Lung Cancer Screening Program

Under the leadership of Mark Parker, M.D., the VCU Department of Radiology, working in conjunction with colleagues in the VCU Department of Pulmonary Medicine, Thoracic Surgery and Smoking Cessation, created the first university-based multidisciplinary Early Detection Lung Cancer Screening Program using low-dose computed tomography in Virginia.

The Early Detection Lung Cancer Screening Program at VCU Massey Cancer Center was Virginia's first American College of Radiology-designated multidisciplinary lung cancer screening center and is also recognized by GO2 for Lung Cancer as a Screening Center of Excellence in Central Virginia. The Center continues to serve as a model for other academic medical screening programs across the country.

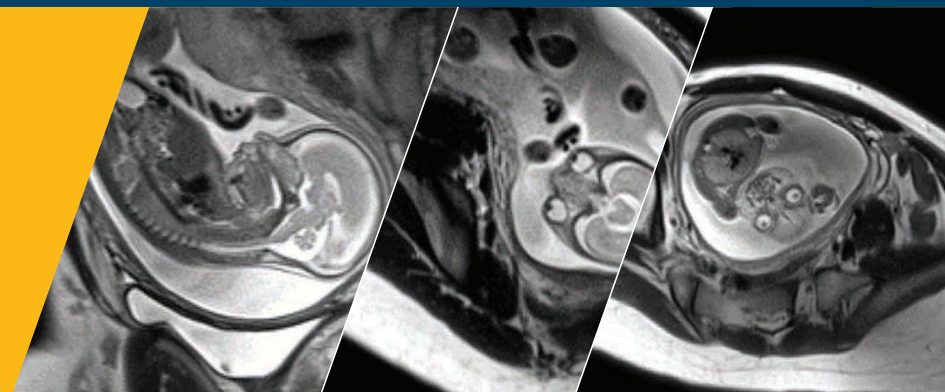
VCU Health 2021 vs. 2022 Total Scans by Month

More than 1,200 patient screenings have been performed and interpreted by the Department's fellowship-trained thoracic radiologists. Data includes VCU Health Tappahannock.



Spotlight: Fetal MRI

Led by Gregory Vorona, M.D., specialty-trained pediatric radiologists have been interpreting fetal magnetic resonance images (fetal MRI) at VCU Health since 2015. Fetal MRI is a non-invasive, non-radiation imaging technique that offers detailed information about the fetal anatomy. This diagnostic procedure can provide additional and complementary information to ultrasound in the evaluation of the fetal brain, spine, face and neck, chest and lungs, and abdomen and pelvis (including bowel and urinary tract). It is tailored to address specific questions and concerns about a suspected congenital abnormality. **Fetal MRI has consistently grown since 2015 and today we perform approximately 70 procedures annually.**



MRI of 21 week fetus

Here, a commitment to safety drives every procedure

Dr. Ann Fulcher, Department Chair, is a leader in safety and compliance. She started the first Enterprise Wide Clinical Radiation Safety Program in 2011 and serves as the Director of the Enterprise Wide Radiation Safety Initiative and Director of the Enterprise Wide Imaging Safety & Compliance Initiative. She works with a team of experts to ensure the safe use of radioactive material and radiation-producing devices throughout the enterprise. The guiding principle of maintaining exposures to ionizing or non-ionizing radiation ALARA (as low as reasonably achievable) is consistent with VCU's policies to foster a culture of safety in the clinical environment.

Our Clinical Radiation Safety and Imaging Safety and Compliance Offices continue to lead the way in radiological security

The VCU Department of Radiology is a leader in medical imaging safety and compliance, with a Clinical Radiation Safety Office focusing on ionizing radiation producing devices including fluoroscopy, diagnostic and CT; and an Imaging Safety and Compliance Office which focuses on non-ionizing radiation producing devices including MRI and ultrasound. In fact, there are few radiology departments in the United States that have an expert team of five diagnostic medical physicists, four clinical educators, and three administrative personnel entirely dedicated to medical imaging safety in X-ray, fluoroscopy, CT, MRI and ultrasound.

Within our Department, ionizing radiation safety and compliance workshops are conducted annually for incoming residents, fellows and graduate medical education interns. Attending physicians, advanced practice professionals and technologists participate in radiation safety training through the onboarding process and ongoing training updates.

Our CT and diagnostic/fluoroscopy imaging safety educators conducted structured compliance and safety clinical site visits at more than 70 ionizing radiation locations throughout the enterprise, providing safety audits and just-in-time coaching on best practices for our team members.

In July 2021, radiation dose monitoring and reporting were enhanced for nearly 100,000 procedures a year through a partnership with Imalogix. Our comprehensive ionizing radiation dose monitoring program and patient follow-up process continue to serve as models and best practices nationally and internationally.

The Imaging Safety and Compliance Office also provided imaging safety and compliance consultation to the VCU Radiation Oncology Department to ensure safe practices with the installation of a new MRI treatment planning unit and a new MRI radiation treatment unit at the Adult Outpatient Pavilion. The team trained more than 35 radiation oncology staff members on the MRI Full Stop safety process, and facilitated simulation sessions to identify clinical workflows prior to the go-live date.

This year, **50+** training sessions were conducted with **180** team members.

The MRI team standardized safety measures across the VCU Health System through the installation of oxygen depletion sensor devices, orange wraps for MRI Safe IV poles, and signage for quench pipe areas. In addition, all VCU Health and Radiology Department MRI policies were revised to reflect the new American College of Radiology MR Safety Guidance.

In the past year, the Department's MR imaging safety educator conducted more than 90 compliance and safety clinical site visits in 13 MRI locations across VCU Health, providing a review of MRI safe practices and just-in-time training to team members.

100,000 procedures a year monitored for radiation dose through a partnership with Imalogix

90+ compliance & safety clinical site visits in 13 MRI locations across the VCU Health System

Proof of performance in safety: outstanding results in the AHRQ Safety Culture Survey

In July 2021, VCU Health assessed its culture of safety using the Agency for Healthcare Research and Quality (AHRQ) Safety Culture Survey. This anonymous survey ranked individual physician units in 10 categories to derive an overall safety score.

The results show that VCU Department of Radiology physicians, including attending physicians and residents, outperformed in all 10 categories compared to the 2021 AHRQ Database of 172 participating hospitals (87,856 respondents) and VCU Health physicians' overall rankings. Physicians also surpassed the national average of teaching hospitals in all 10 categories. Teaching hospitals made up 41 percent of the participating hospitals.

VCU Health's Radiology physicians earned an extremely high safety score and were in the 90th percentile in five categories: teamwork, staffing and work pace, organizational leadership/continuous improvement, responses to error and communication openness.

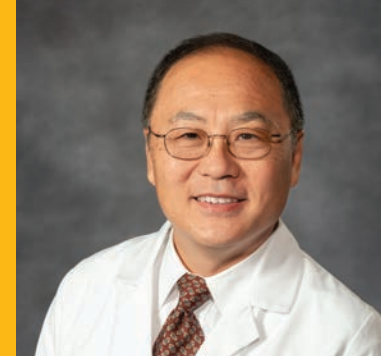
The Department's leadership attributes the high rankings to a supportive, proactive environment where physicians and staff focus on continuous improvement and problem solving.

The AHRQ is a federal agency charged with improving the safety and quality of the U.S. health care system. The agency's mission, as stated on the AHRQ website, "is to produce evidence to make health care safer, high quality, more accessible, equitable, and affordable, and to work within the U.S. Department of Health and Human Services and with other partners to make sure that the evidence is understood and used."



Imaging excellence relies on the seamless flow of information

Headed by Doug Ro, Ph.D., our Radiology Information Technology Section (Radiology IT) has been critical in helping our heavily weighted digital Department achieve success. This state-of-the-art Department transitioned to digital images in 2001 with complete digital image storage and retrieval, ordering and reporting integrated into the hospital network, and the receiving and processing of images from all of our many remote sites. Our Radiology IT Section staff have been innovative problem solvers at all levels to keep the Department functioning seamlessly and outpace our peers. They are recognized as leaders in the field of Radiology IT and enterprise-wide imaging IT.



Doug W. Ro, Ph.D.

Associate Professor
PACS Director

342
radiological
devices

It begins with 342 radiological devices (e.g., MRI, CT, X-ray, ultrasound, PET, SPECT, mobile C-arms, etc.) that Radiology IT integrates into a centralized image routing system, which receives, distributes and archives to Picture Archiving and Communications System (PACS).

149
PACS
workstations

Our radiologists use 149 dedicated PACS workstations built by Radiology IT to read and dictate studies; 49 of them are deployed in radiologists' homes.

2
dictation
systems

Radiology IT also supports two dictation systems, data analytics for device utilization, and a natural language processor for the detection of actionable findings.

150
radiology
servers

There are more than 150 radiology servers (both virtual and physical servers) in the Clinical Support Center and Parham Data Center that Radiology IT built and supports to connect PACS with various image processing systems, such as a 3-D renderer, AI-assisted stroke detector, Lung Cancer Screening, the Heart-flow and Cardiac Motion Visualizer, as well as dosage monitoring systems and bedside ultrasound Qpath.

2
PACS
systems

There are two PACS systems that Radiology IT manages: ChangeHealth PACS for Radiology and Intellispace PACS for the VCU Health System Enterprise. Intellispace PACS is tightly integrated into VCU Health's EPIC electronic medical records to allow clinicians easy access to not only current studies but to all studies acquired since 2001. Two copies of all imaging studies that are digitally archived in Mach7's Vendor Neutral Archive are housed separately in VCU Health's Clinical Support Center and Parham Data Center for redundancy and data disaster recovery.

Exceptional accomplishments in Radiology IT

Two recent accomplishments by Radiology IT stand out:

- / At the start of the COVID-19 pandemic, the Department conducted a rapid deployment of PACS workstations to radiologists' homes to ensure the safety of both attending radiologists and residents without loss of function or productivity.
- / The January 2023 rollout and full integration of PACS into EPIC Carelink allow community referring physicians easy access to VCU Health Radiology studies.

Advanced education and research

We educate the next generation of care providers, and advance medical education and research through:

- / Medical student education
- / Resident education
- / Fellow education
- / Technologist education
- / Nursing education
- / Technologist and nursing student education
- / Radiologist assistant educational program
- / Nurse practitioner education
- / Patient education
- / Physician continuing medical education (local, regional, national and international)
- / Visiting fellowships, web-based teaching and innovative teaching modules
- / Clinical research through collaboration and support of basic science
- / Funded research

VCU School of Medicine
Egyptian Building.



Ensuring an educational experience that is the entry point for success

The VCU Department of Radiology Residency Programs: an overview

With its strong clinical and academic foundation, the VCU Department of Radiology Residency Programs train residents in all subspecialties and advanced subspecialties of diagnostic radiology. These programs continually attract residents who graduate at the top of their medical school class. Residents are recruited to competitive fellowships and medical practices upon completion of their residency.

The residency program currently has 38 residents: four classes of seven residents in the diagnostic radiology program, and five classes of two residents in integrated interventional radiology.

Academic innovation leads to valuable online resource for radiology residents

Jeffrey Elbich, M.D., Interventional Radiologist and Integrated Interventional Radiology Residency Associate Program Director, is more than an outstanding team player—he's also the creator of a highly useful online resource for radiology residents. Dr. Elbich originally created TeachingIR.com in 2020 as a "case of the week" website to serve as a teaching aid for residents. The website continues to grow in scope and has become an invaluable resource for residency education and Board Exam preparation.

2023 Radiology residents by the numbers

All 7 diagnostic radiology residency positions and 2 integrated interventional radiology residency positions successfully matched with high-ranking applicants.

1,210 diagnostic radiology applications

38 total residents

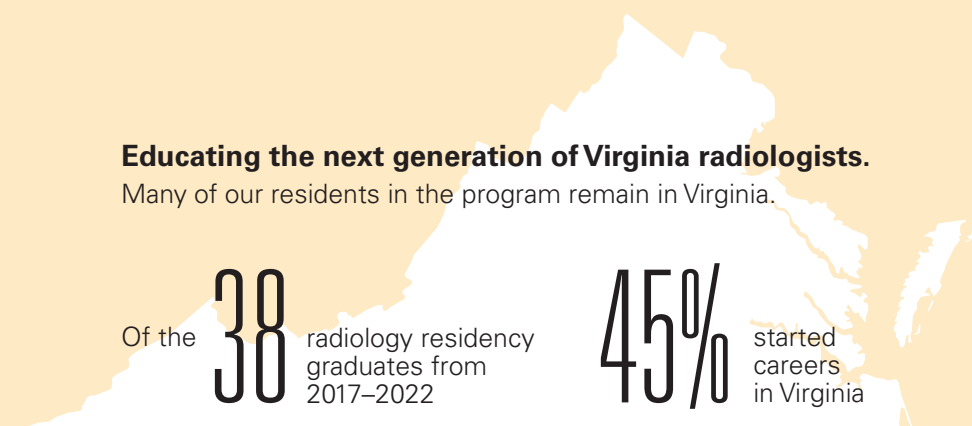
156 interventional radiology applications

Educating the next generation of Virginia radiologists.

Many of our residents in the program remain in Virginia.

Of the **38** radiology residency graduates from 2017–2022

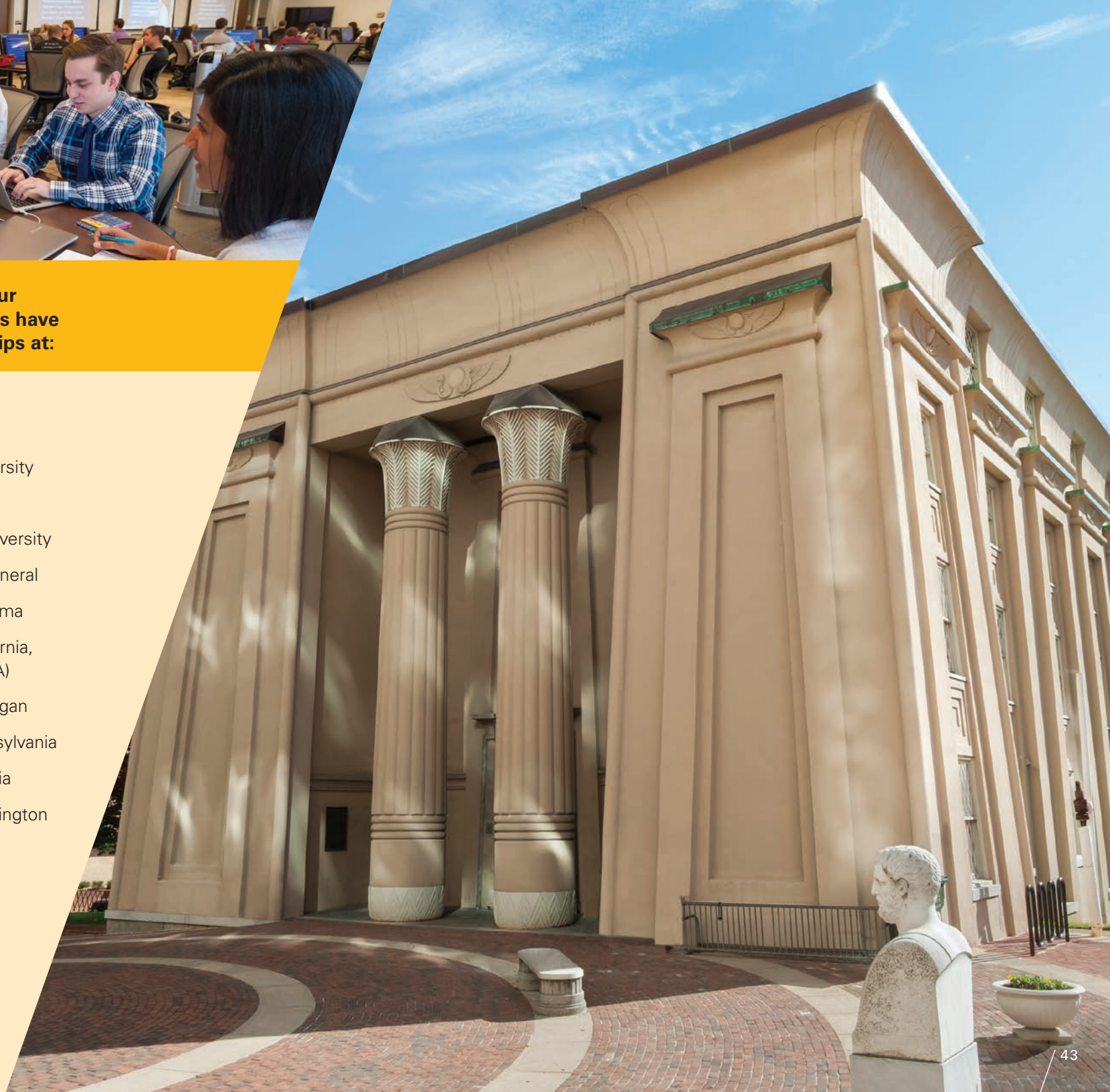
45% started careers in Virginia





From 2019–2022, our Radiology residents have gone into fellowships at:

- / Emory University
- / Georgetown University
- / Harvard University
- / Johns Hopkins University
- / Massachusetts General
- / University of Alabama
- / University of California, Los Angeles (UCLA)
- / University of Michigan
- / University of Pennsylvania
- / University of Virginia
- / University of Washington
- / **VCU Health**
- / Yale University




Educating a higher level of specialists through radiology fellowships

The VCU Department of Radiology offers a variety of non-CAQ fellowship positions. Our Department also sponsors eight to ten one-year fellowships each year in a number of subspecialties, enabling fellows to develop the specialized skills necessary for a successful career in an academic or private practice setting. These fellowships include:

- / Abdominal Imaging Fellowship
- / Breast Imaging Fellowship
- / Emergency Radiology Fellowship
- / MRI Fellowship
- / Musculoskeletal Imaging and Intervention Fellowship
- / Thoracic Imaging Fellowship
- / Women's Imaging Fellowship





"My Residency in Diagnostic Radiology and Fellowship in Abdominal Imaging at VCU thoroughly prepared me for my subsequent career as a private practice radiologist. My Fellowship not only provided me with a more in-depth knowledge base in abdominal imaging, but also enhanced my overall ability as a radiologist to function both independently and as a team member. It fostered critical thinking and innovative approaches. Also, the supportive and collegial atmosphere of the Department resulted in enduring friendships with other residents/fellows, faculty members and staff."

– Gerald W. Capps, M.D.
Nash X-Ray Associates, P.A. in Rocky Mount, NC
Chairman, Department of Radiology
UNC Health – Nashville

Completed fellowship in 1997

"I can easily say the year I spent in Richmond was the best of my entire education. What I learned in that year still serves as the foundation for what I do every day in practice almost 20 years later. A department full of intelligent but warm people who were so welcoming to me from the very first day."

– Eric A. Bogner, M.D.
Attending Radiologist Hospital for Special Surgery
Professor of Clinical Radiology
Weill-Cornell Medical College

Completed fellowship in 2005

"I completed my radiology residency at VCU in 1995, and my fellowship in Neuroradiology in 1996. I cherish my time as a fellow, recalling the outstanding guidance and mentorship of my attendings as well as the incredibly broad range of pathology I was able to learn from. My fellowship gave me a new level of expertise that I was privileged to provide to the Tidewater Virginia area for over 20 years.

I think the excellent training I received at VCU elevated the level of health care in my area and brought a level of increased respect from my community to both my private practice group as well as the Radiology Department of VCU."

– Stephen D. Foxx, M.D.
Assistant Clinical Professor of Radiology
VCU Health

Completed fellowship in 1996

ANNIVERSARIES

Celebrating exceptional years of service to VCU

Congratulations to these crucial members of our faculty, who go above and beyond every day

Mary Ann Turner, M.D. **48 years**
 Jean Ashton **43 years**
 Sherry Elliott, M.B.A. **37 years**
 Frank Corwin, Ph.D. **29 years**
 Ann Fulcher, M.D. **28 years**

Siddhi Shah, M.D. **24 years**
 Jinxing Yu, M.D. **23 years**
 Warren Stringer, M.D. **23 years**
 Mark Parker, M.D. **22 years**
 Doug W. Ro, Ph.D. **22 years**
 Laura Carucci, M.D. **21 years**

20 years

Ahmet Baykal, M.D.
 John Grizzard, M.D.
 Uma Prasad, M.D.

18 years

Daniel Komorowski, M.D.
 Malcolm Sydnor, M.D.

16 years

Jianqao Luo, Ph.D.



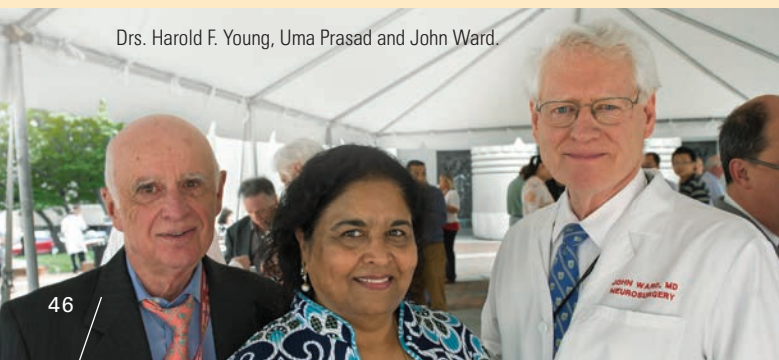
Chris Shaver, Blaine Hurt, Dr. Mary Ann Turner and Sharon Gibbs.



Drs. Melvin Fratkin and Jinxing Yu. Dr. Fratkin served as a member of the Radiology Department for 46 years prior to retiring in 2017.



Bob Styer, Sherry Elliott who has been with the Department for 37 years and Joyce Fratkin.



Drs. Harold F. Young, Uma Prasad and John Ward.

Support for the continuation of excellence

The Mary Ann Turner Alumni Society honors a legendary professor

We are pleased to announce the formation of the Mary Ann Turner Alumni Society, a VCU Department of Radiology Alumni Society, in 2024. The society honors the 48-year career of Mary Ann Turner, M.D. at the VCU Department of Radiology.

Dr. Turner serves as Professor of Radiology, Vice Chair of Faculty and Director of Gastrointestinal and Genitourinary Radiology in our Department. She was the first female faculty member in the Department and the first woman to practice radiology in central Virginia. As one of the longest-serving faculty members in the history of our Department, she has made many contributions to our Department, the VCU Health System, and the profession of radiology from the local to the national level.

Since 1975, Dr. Turner has shared her expansive fund of knowledge of abdominal imaging with hundreds of radiology residents and fellows, both at the workstation and in the procedure rooms. Although well known to our alumni and current residents, her teaching prowess has been recognized with the Departmental Klaus Ranniger Memorial Award for Excellence in Resident Teaching multiple times over the years. She also received the School of Medicine Irby-James Award for Teaching Excellence in 2013, and her teaching and many contributions to abdominal radiology were recognized on a national level in 2011 when she received the Lifetime Achievement Award from the Society of Abdominal Radiology.

Given Dr. Turner's lifelong dedication to radiology and radiology resident education, the goal of the Mary Ann Turner Alumni Society is to create a strong community of current and former residents, fellows and faculty members dedicated to supporting our residents.

Radiology is key to effective health care. The Radiology Residents' Fund helps ensure its future.

We are thankful to our alumni and friends for supporting educational and research endeavors for our residents over the years and hope you will continue doing so. To make a gift, go online to radiology.VCU.edu/alumni or by mail to the VCU School of Medicine, Department of Radiology, P.O. Box 980470, Richmond, VA 23298-0470. For further information or questions, please call the VCU Department of Radiology at (804) 828-6600.



A MESSAGE FROM OUR CEO

Dear Dr. Fulcher,

On behalf of the VCU Health System, I am writing to express my strong support for the VCU Health Department of Radiology, both from my perspective as the Interim CEO for VCU Health and in my role as David M. Hume Endowed Chair and Professor, Division of Transplant Surgery and Director of the VCU Health Hume-Lee Transplant Center. Now in my eighth year here, as an active clinician and health care administrator, and after a now 30 years plus career in transplant surgery, I feel well qualified to write this letter of support.

The Department of Radiology has supported Transplantation Surgery and indeed the entire Health System in a multilayered, comprehensive, and incredibly high-quality way. The superb quality of your diagnosticians and interventionalists, the comprehensiveness of your practitioners' approach, their expertise in applying the best technologies and the most current methodologies to their work have been valuable. We count all your team members as colleagues exhibiting the highest possible collaboration.

Importantly, your team's approach to multidisciplinary tumor boards and multidisciplinary care clinics is simply ideal. The role that the Radiology Department writ large plays in the education of literally thousands of learners every year is essential.

The Radiology Department plays an invaluable role within the VCU Health System, as well as locally, nationally and internationally. The kind of clinical care delivered by VCU Health teams, from the everyday to the highest-complexity quaternary care, would absolutely not be possible without the deep collaboration of you and all of your colleagues. Certainly, our solid organ transplant program could not have realized the sort of growth that has now put it amongst the foremost transplant centers worldwide without the deep partnership of your team.

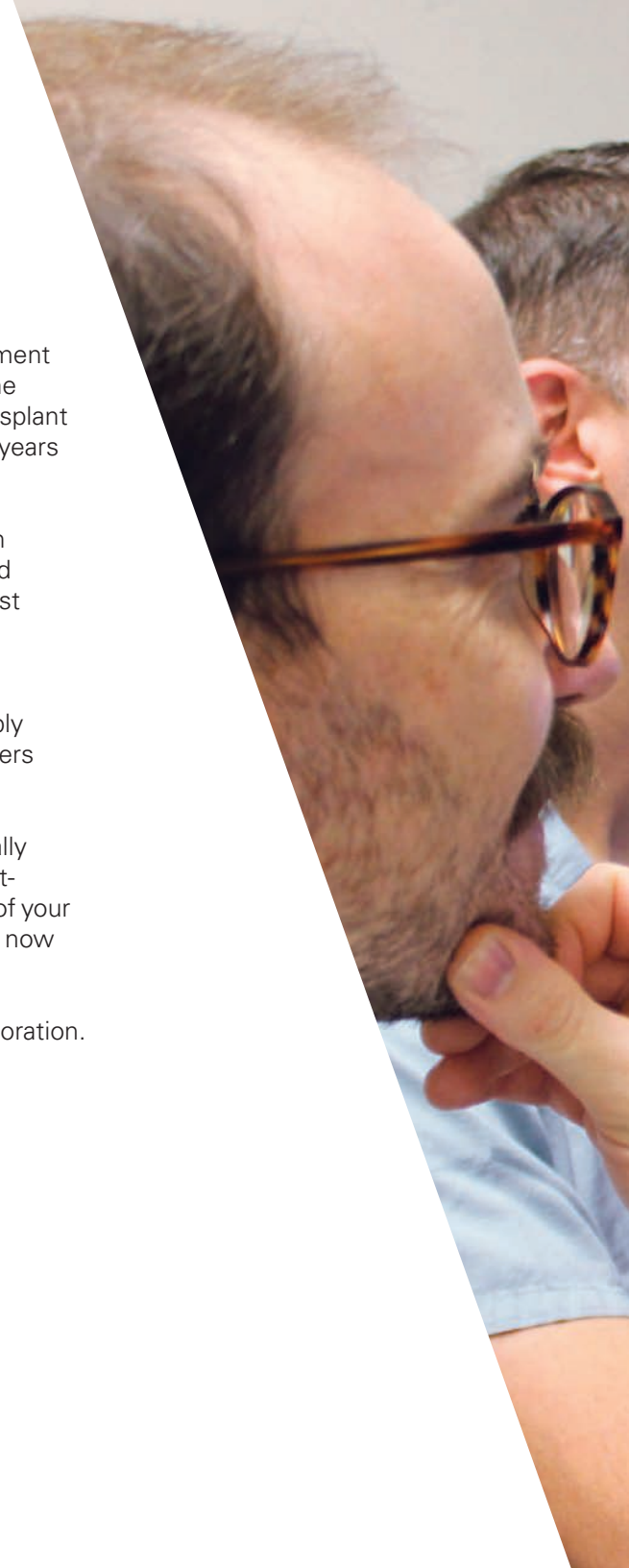
We are profoundly appreciative of the partnership and look forward to many more years of exemplary collaboration.



Sincerely,

Marlon F. Levy, M.D., M.B.A.

Interim Senior Vice President of VCU Health Sciences and
Chief Executive Officer of VCU Health System Authority







VCU Department of Radiology

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