

## CLINICAL SPOTLIGHT



Imaging Department Managers and Leadership team, left to right:  
Susan Castillo, Manager of MRI  
Derek Berz, SVP and Chief Operating Officer  
Sam Rodriguez, Manager of Ultrasound  
Christine Thune, Manager of Diagnostic Radiology  
Andy Tran, Manager of Nuclear Medicine & PET/CT and Imaging Assistants  
Yolanda Gonzalez, Manager of Imaging Nursing and 4E Outpatient  
Dianna Tyndall, Radiology Clerical Supervisor  
Belal Madha, Manager of CT  
William Ogan, Manager of Interventional Radiology  
Khalid Shariff, Director of Imaging Services  
Naween Syed Ilyas, Imaging Educator



# UNDER THE SURFACE

IMAGING PROVIDES INFORMATION CRITICAL TO DIAGNOSIS AND TREATMENT.

WRITTEN BY NANCY SOKOLER STEINER  
PHOTOGRAPHED BY MICHAEL NEVEUX

Struggling to breathe, the patient is rushed to the emergency department. The emergency physician orders a chest X-ray, which rules out pneumonia and other chest-related diseases. Next, the patient undergoes an ultrasound to check for a clot in his legs and a CT scan to look for clots in his chest. The CT scan reveals a pulmonary embolism—a clot in the arteries sending blood to the lungs. He then goes to the interventional radiology suite, where physicians pinpoint and remove his clot. “At this point, the patient has undergone four modalities of imaging: X-ray, ultrasound, CT and interventional radiology,” notes Khalid Shariff, Torrance Memorial Medical Center’s director of imaging services. “Thanks to the skill of practitioners and advances in technology, the patient is able to go home the same day he experienced what was previously a fatal condition.”

## CLINICAL SPOTLIGHT

Imaging reveals what's happening inside the body, helping physicians diagnose and treat problems as well as confirm a problem was successfully treated. Using sophisticated equipment, Torrance Memorial's team of more than 300 imaging technologists, radiologists, nurses and support staff provided 337,000 imaging procedures in the hospital last year. (Another 50 experts provide comprehensive imaging services at the Vasek and Anna Maria Polak Breast Diagnostic Center's four locations.)

"Maintaining a state-of-the-art imaging department with cutting-edge technology and highly skilled professionals is paramount for a hospital's diagnostic and interventional care capabilities," says Derek Berz, senior vice president and chief operating officer. "Torrance Memorial continues to have advanced imaging capabilities that not only enhance the accuracy and efficiency of diagnostics but also enable specialized consulting, ensuring patients receive precise and tailored medical interventions. This ultimately elevates the overall standard of health care within the institution."

Imaging technologists must earn certification from an accredited program for their specific imaging modality, which takes at least two years. Torrance Memorial also requires its technologists to obtain state and national licenses. Because imaging is so crucial to providing care, the department maintains 24-hour staffing for most modalities. Technologists work in concert with radiologists as well as other physicians in the medical center.

"Our radiologists are always looking at evolving technology, and we in the imaging department have visited equipment manufacturing plants to see what they're working on," says Shariff. "This allows us to plan for equipment additions and replacements over the coming decade. We like to remain ahead of the curve."

The medical center's imaging

department offers the full breadth of services including state-of-the-art technologies and procedures, some of which are typically found only in academic facilities. Each type of imaging has its unique function and uses:

### X-RAY

**How it works:** When X-ray beams pass through the body, organs, tissues and bone absorb the rays at different rates. A detector converts this absorption into images.

**When it's used:** Common uses for X-rays include detecting bone fractures, pneumonia and certain cancers. Portable radiography allows for digital images to be taken at the bedside. It helps physicians and nurses with procedures such as inserting and precisely placing ventilator tubes, feeding tubes and central lines.

### FLUOROSCOPY

**How it works:** A sort of continuous X-ray, fluoroscopy provides continuous, real-time X-ray video rather than producing single images.

**When it's used:** Fluoroscopy helps physicians diagnose a range of problems, including gastrointestinal and cardiac conditions, and issues involving the bladder, kidneys, musculoskeletal system and reproductive organs. For example, doctors can see a patient swallowing in real time. Fluoroscopy may also take place during procedures such as placing screws or plates during orthopedic surgery or inserting a catheter into the heart. Portable fluoroscopy allows for imaging at the bedside of patients too ill to be transported.

### ULTRASOUND

**How it works:** Ultrasound uses high-frequency sound waves to create images of organs, tissue or blood flow.

**When it's used:** Commonly used to monitor the growth and development of the fetus during pregnancy, ultrasound also helps physicians visualize the heart

and blood vessels, abdominal organs, brain, thyroid, skin and muscle.

### CT (COMPUTED TOMOGRAPHY) SCAN

**How it works:** The donut-shaped Computed Tomography Scanner uses rotating X-rays to produce cross-sectional images—or slices—of the body. Spectral technology provides images of anatomical features previously not available, such as certain tumors or calcifications. Torrance Memorial has multiple CT machines, as well as a Portable Cone Beam CT scanner—also known as an O-Arm—which makes this technology available right in the operating room.

**When it's used:** Individual images and those combined to produce 3D images show bones, muscles, organs and blood vessels. They aid in diagnosing a wide range of diseases or injuries, including pneumonia, tumors, blood clots, strokes and bone fractures. CT can help guide lung biopsies and catheter insertions, among other procedures.

### PET (POSITRON EMISSION TOMOGRAPHY) SCAN AND NUCLEAR MEDICINE

**How it works:** Using the same equipment as a CT scan, positron emission tomography involves a patient intravenously receiving a small amount of a radioactive substance that allows for continuous images. PET and CT are frequently performed together.

**When it's used:** Nuclear medicine provides functional information and enables early detection of certain diseases. It is used in cardiology for assessing heart function. The bone scans detect abnormalities, aiding in orthopedic diagnoses.

### MRI (MAGNETIC RESONANCE IMAGING)

**How it works:** MRI uses magnets and radio waves to produce images of organs and structures inside the body. MRIs

typically require patients to be inside a narrow tube-like space, but Torrance Memorial's MRI machines have a more open design and produce exceptionally detailed images.

**When it's used:** Particularly helpful for examining the brain and spinal cord, MRI is used for practically all areas of the body, including the abdomen, chest and limbs.

## MAMMOGRAPHY

**How it works:** Using a special X-ray machine, a technologist places the breast between two plastic plates to be compressed. The compression flattens and spreads out the breast tissue. The breast stays under compression for about 10 to 15 seconds per image while the X-ray is being taken. The technologist takes a minimum of two images of each breast.

**When it's used:** A mammogram can be a screening or diagnostic evaluation of the breast tissue to detect cancer or other changes in the breast.

## INTERVENTIONAL RADIOLOGY

**How it works:** Using catheters (small, hollow tubes) and tiny instruments, interventional radiologists perform image-guided procedures on veins and arteries. Many of the conditions treated with interventional radiology previously required open surgeries. Torrance Memorial recently completed a state-of-the-art Interventional Radiology Suite featuring biplane imaging, which uses two sets of cameras to provide real-time 3D images that can be rotated to view anatomy at all angles (see sidebar).

**When it's used:** Treatments performed by interventional radiologists include repairing blocked arteries, stopping gastrointestinal bleeding, and destroying tumors and fibroids.

Imaging physicians, nurses and technologists stay up to date on safety and best practices thanks to imaging services educator Naween Q. Syed. She creates and implements standard operating procedures for the department and trains department personnel to function safely and effectively.

The many scans and procedures performed by the imaging department require meticulous coordination. In August 2022, Syed oversaw the adoption and implementation of the Clinical Workflow Suite (CWS), a tracking system that monitors the status and timing of cases to ensure radiologists, staff, patients and equipment are deployed most effectively. "We were able to design CWS in a way that works best for our hospital," Syed says.

The software helps the transportation room staff route technologists and patients most efficiently, thus minimizing wait times. "This is especially important in cases where time is of the essence, such as with stroke patients," she says.

Torrance Memorial dedicates substantial financial resources to provide the finest imaging equipment and services. In addition, notes Shariff, "We're lucky to have philanthropic support from the community for our department and the hospital in general. Community members see what we do and recognize the importance of the role we play."

He adds: "Even more important than our sophisticated equipment and technology, it's the commitment and skill of our people that makes our department so strong. I'm particularly proud of the longevity of our staff. Many have been here for 20+ years, and some have been working here for more than 40 years. That's unusual, but it reflects the support of management, the institutional culture and the people we work with." •



## IMPACT ON THE FUTURE

### THE NEW IR SUITE AT TORRANCE MEMORIAL

Biplane imaging is one of the most advanced interventional medical technologies. It captures CT images of the (lying down) body from top to bottom and side to side. Biplane imaging brings enhanced precision to complicated vascular and neurological procedures by providing 3D anatomical views in real time. Torrance Memorial Medical Center created the new Interventional Radiology Suite with biplane imaging, thanks to the generous \$5.1 million donation from Patricia and Gerald Turpanjian. The suite, which debuted in the summer of 2023, has been used for such procedures as opening blocked or narrowed blood vessels, repairing aortic aneurysms and administering clot-busting medications to treat stroke.