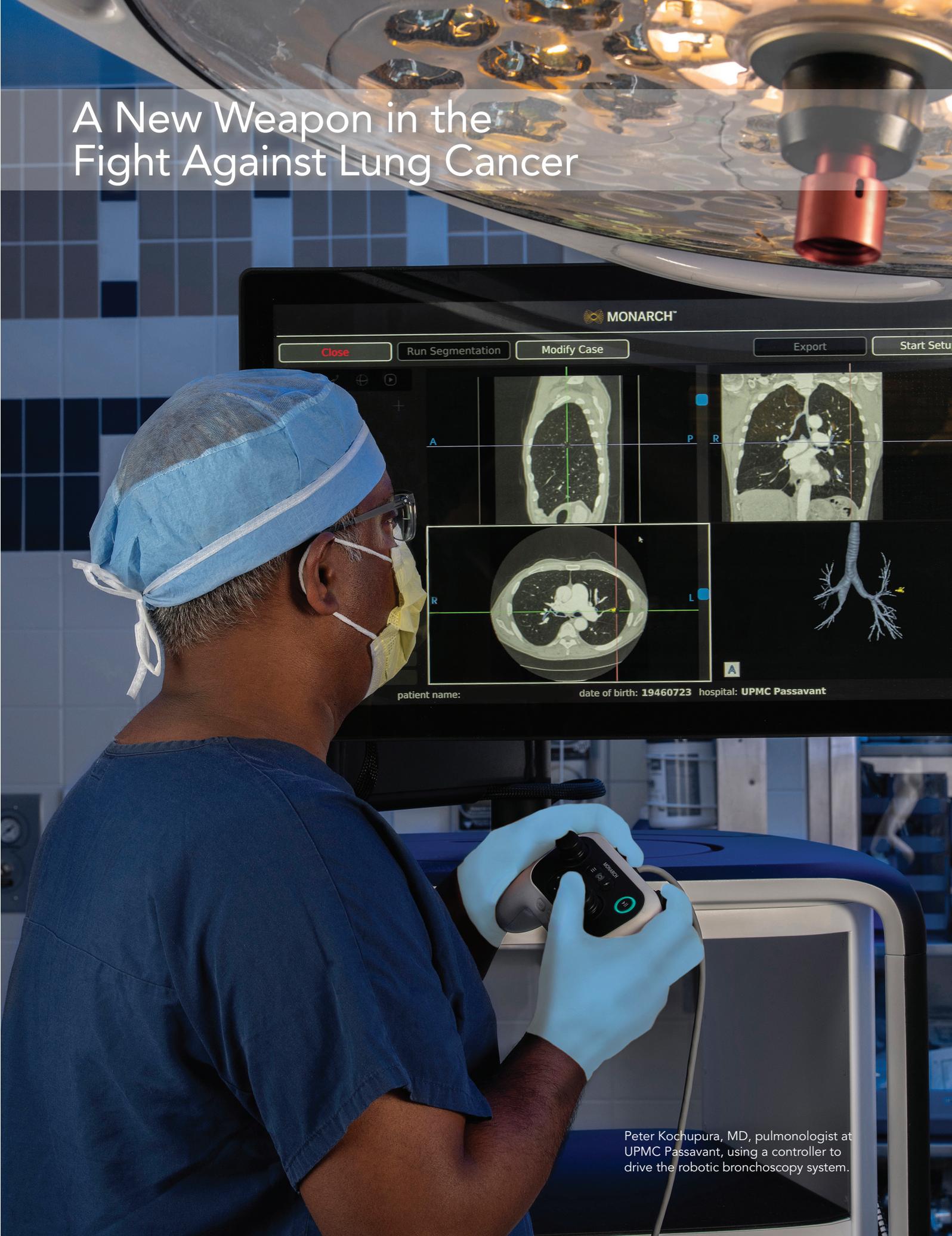


# A New Weapon in the Fight Against Lung Cancer



Peter Kochupura, MD, pulmonologist at UPMC Passavant, using a controller to drive the robotic bronchoscopy system.

# A New Weapon in the Fight Against Lung Cancer

*At UPMC Passavant–McCandless, an exciting new robotic device—the first in southwestern Pennsylvania—is enabling doctors to navigate deep inside the lungs for earlier, more precise detection of cancer.*



Peter Kochupura, MD, pulmonologist at UPMC Passavant and Ryan Levy, MD, chief of thoracic surgery at UPMC Passavant, with the robotic bronchoscopy system.

It's hailed as a game changer in the treatment of lung cancer. The Monarch™ robotic bronchoscopy system allows doctors to maneuver into the lung's tiniest passages to inspect suspicious lesions and collect tissue samples to determine whether they are cancerous or benign.

UPMC Passavant is among the first hospitals in the nation to use this technology, which received approval from the U.S. Food & Drug Administration in 2018.

Doctors navigate the device using a controller similar to what's used to play video games. "It's fantastic," says Ryan Levy, MD, chief of thoracic surgery at UPMC Passavant. "As a surgeon,

I'm excited to have this tool in my hand. It takes us to a whole new level of cancer diagnosis and treatment."

According to the American Lung Association, lung cancer is by far the deadliest form of cancer for both men and women. More than half of all lung cancer patients die within a year of being diagnosed. But when it is detected early — especially before it has a chance to spread beyond the lungs — the five-year survival rate rises from 5% to 56%.

"Early diagnosis is key," says Dr. Levy. "When lung cancer is detected at an earlier stage, we're able to offer patients better treatment options."

## A BRILLIANT DESIGN

Peter Kochupura, MD, a pulmonologist at UPMC Passavant, says the “brilliant” design uses a minimally invasive endoscope to view deep inside the lungs. The technology integrates the latest advancements in robotics, software, and data science with endoscopy, which uses small cameras and tools to enter the body through the patient’s mouth.

Robotic bronchoscopy provides a continuous, extraordinarily detailed 3D view of the lungs’ airway passages, which he compares to tree branches.

“The lungs have a main trunk that divides into two large branches and then many smaller branches that become tinier and tinier. Each branch comes off at an angle,” says Dr. Kochupura. “Before this new innovation, we couldn’t reach the farthest branches of the lungs reliably to biopsy a nodule.”

Instead, doctors used navigational bronchoscopy to create a 3D virtual roadmap based on a computed tomography (CT) scan of the lung. “Navigational bronchoscopy is a great tool, but it has its limitations. It’s like GPS telling you to turn here and turn there,” says Dr. Kochupura. “We had to rely on the computer to tell us where to go and make a best guess about the location of the lesion when doing biopsies.”

With robotic technology, the doctor can use the controller to direct the probe, see exactly where it is going, and identify the best spots to take biopsy samples.

According to Dr. Kochupura, that’s critical because a certain amount of cells is needed to identify the tumor’s “fingerprint” and select the appropriate targeted therapy.

“With the robot, we can go as far as we need, and look directly at the lesion. We can rotate it and look at it from every angle,” he says. “It goes exactly where we want it to go and doesn’t move until we tell it to do so. It’s remarkable.”

“Robotic bronchoscopy will increase chances of survival and do so without unnecessary invasive diagnostic procedures,” adds Dr. Kochupura. “Having this new system at UPMC Passavant speaks to the overall quality of service we provide.”

## A RECOGNIZED LEADER

“We are excited to use this technology to offer a more hopeful future for our patients with lung cancer,” says Susan Hoolahan, UPMC Passavant president.

“This is another example of UPMC leading the way with the most innovative technologies the health care industry offers. We’re especially proud to be able to offer robotic bronchoscopy to our patients at UPMC Passavant,” she adds.

According to Dr. Levy, UPMC Passavant was selected as a novel site because it had the qualifications that Monarch’s manufacturer, Auris Health, was looking for: a high-volume practice well-positioned to be a leader in the use and training of the device.

The incidence of newly diagnosed cases of lung cancer is on the rise in western Pennsylvania — and across the nation — thanks in part to the advent of more widespread lung cancer screening programs, says Dr. Levy.

UPMC Passavant was the first in the UPMC system to offer low-dose CT scans of the lungs to screen for cancer in high-risk individuals. Doctors at the hospital have extensive experience in using navigational bronchoscopy to diagnose and treat lung cancer. This expertise positioned UPMC Passavant to be at the forefront in using the new robotic bronchoscopy system.

“Auris identified UPMC Passavant as a premier lung cancer program in western Pennsylvania. It speaks volumes for UPMC as a leader in the treatment of thoracic cancers,” says Dr. Levy.

Dr. Levy and Dr. Kochupura, along with two respiratory therapists and two other hospital staff members, traveled to the company’s facilities in San Francisco for training to learn how to use the robotic bronchoscopy technology. They began using it with patients in May.

Monarch™ robotic bronchoscopy instruments



# Advanced Cancer Care and Expertise: It's all Here

UPMC Hillman Cancer Center is one of the largest integrated community networks of cancer physicians and health care specialists in the United States, giving more patients and their families access to world-renowned care.

The UPMC Hillman Cancer Center medical, radiation, and surgical oncologists at UPMC Passavant–McCandless provide patients with high-end diagnostic tools like the robotic bronchoscopy system described in this article — and state-of-the-art treatment technologies that range from 4D respiratory-gated imaging, gated intensity modulated radiation therapies, stereotactic body radiotherapy (SBRT), and on-board imaging.

Both UPMC Passavant campuses (McCandless and Cranberry) feature onsite UPMC Hillman Cancer Centers, offering advanced cancer diagnosis, treatment, and care, including expertise in breast, lung, esophageal, upper gastrointestinal, pancreas, colorectal, and liver cancers.



Full robotic bronchoscopy system

## POISED FOR THE FUTURE

Dr. Levy believes the technology will continue to evolve.

"This isn't just another diagnostic tool. It's a tremendous advancement in terms of accuracy, early detection, and diagnosis. The technology has the potential to revolutionize treatment as well," says Dr. Levy.

He predicts that within the next five years, robotic bronchoscopy will be used not just to diagnose lung cancer, but also to treat cancer using microwave or radiofrequency ablation. Microwave ablation uses electromagnetic waves to heat and kill cancer cells. Radiofrequency ablation uses an electric current.

"It's the next step in lung cancer diagnosis and treatment," he says.

When that technology does come along, UPMC will be ready and waiting.

"UPMC Passavant is poised for the future," says Dr. Levy. "As the first health care provider in Pittsburgh to have the robotic bronchoscopy technology, we are well-positioned to lead. We're looking forward to using other cutting-edge technology to treat our patients."

"Whether you live close by or far away, UPMC Passavant has the advanced and comprehensive lung cancer care you need."

\* *Monarch™* is a trademark of Auris Health, Inc.

The information in this article was provided by UPMC.