

the pulse



Solving the puzzle
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The *Pulse* is a publication from the Allegheny Health Network (AHN) Cardiovascular Institute for referring physicians.

Please send your comments to laurann.may@highmarkhealth.org.

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ON THE COVER

Dr. Candice Lee, Cardiothoracic Surgeon

Message from our chairmen

We talk a lot about multidisciplinary care. Most of us would say it's when a health organization has specialists from various areas come together to provide a patient with expert, comprehensive care.

While that's true, our model at AHN harnesses many other facets of integration. For example, offering multidisciplinary heart care means we collaborate with each other about whether a patient needs surgery, a catheter-based procedure, medical treatment, or a hybrid approach. It also entails having the patient, the patient's family, and their referring physician involved in the decision-making process and invested in the best long-term outcome for the patient.

In the pages ahead, we highlight our multifaceted approach to cardiovascular care. You will read about our program for treating and managing chronic thromboembolic pulmonary hypertension (CTEPH). Pulmonary thromboendarterectomy (PTE) surgery can cure many patients with CTEPH. The surgery is so complex and specialized that only a few select facilities in the country perform PTE. AHN is one of them, and patients have had excellent outcomes with their pulmonary pressure returning to normal and their quality of life improving dramatically.

You will also read about our specialists at the Women's Heart Center discussing the importance of recognizing social determinants of cardiovascular health in women. Factors such as financial struggles, having limited education, and growing up in poverty can

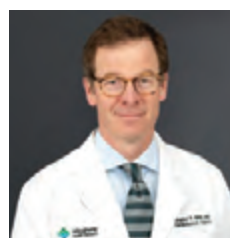
affect a person's ability to afford fresh, healthy food, live in safe housing, go to the doctor, or pay for treatment and medication. We're addressing those barriers by advocating for change and working closely with colleagues to create awareness of these disparities.

Another article features our Lung Cancer Lobectomy Surgery Program, which earned a distinguished three-star rating from the Society of Thoracic Surgeons (STS) for its patient care and lung cancer resection outcomes. It's the highest rating for quality that a hospital can earn.

Finally, we talk about how virtual care has remained steady and strong after taking off during the pandemic. With our remote patient monitoring already well established for a decade, digital cardiovascular care became an obvious way for us to provide high-quality access to all patients, equally, across socioeconomic classes.

We invite you to refer patients to our multidisciplinary program, or to reach out to us for a consultation. We appreciate your continued partnership, as you are an essential part of our team.

Sincerely,



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AHN Department of Thoracic
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Solving the puzzle

CALIFORNIA MAN RECEIVES CTEPH DIAGNOSIS AND CURE AT AHN

Travis Ruffus knew that relocating from the West Coast to Pittsburgh with his wife and three daughters would be a stressful and challenging time.

But he never imagined the move would save his life.

Travis, 44, was living in Bakersfield, California, working long days in the oil fields and tackling a rigorous fitness program four days a week, when he contracted valley fever, or coccidioidomycosis, in 2018. It's an infection caused by the fungus *Coccidioides*, known to live in soil in the southwestern United States and parts of Mexico and Central and South America.

He was treated with antimicrobials and recovered quickly. But, six months later, any form of exertion left Travis exhausted. He noticed his oxygen levels were depleting, and he had little to no energy.

His primary care and infectious disease doctors told him he was dealing with residual effects of valley fever.

"Just walking up the stairs was a battle," Travis said. "I tried articulating to the doctors that there was something different about how I was feeling. With valley fever, I felt shortness of breath, but with this, I felt like I couldn't get enough oxygen. It was very scary."

TRAVIS RUFFUS

CTEPH patient, enjoying time with his family after recovering from surgery.







A NEW PERSPECTIVE

In August 2020, Travis and his family relocated to Pittsburgh. He began seeing AHN pulmonary specialist Eric Bihler, DO, who suspected there was more to the story and referred Travis to AHN cardiologist Lindsay Mehring, DO.

“By surgically removing the blood clots from arterial branches in the lungs, we could reverse his heart failure.”

**— Dr. Candice Lee,
Cardiothoracic Surgeon**

“What was so cool with working with two different groups of doctors is to see the big difference between them,” said Travis’ wife, Raelyn. “In California, he saw his cardiologist and pulmonologist and he was acting as the liaison between the two doctors, having to relay his test information to each of them.

“And then we came here to AHN, and one doctor would pull in another doctor, and then another, until a whole team was built for Travis, and they all worked together and communicated with each other. And I felt like for the first time someone listened and heard Travis.”

Dr. Mehring performed a series of stress tests, then referred Travis to Hayah Kassis-George, MD, a heart failure and transplant specialist. She did a ventilation-perfusion scan and a pulmonary angiogram. Those tests revealed blood clots in Travis’ lungs, suggesting chronic thromboembolic pulmonary hypertension (CTEPH).

CTEPH is a rare and progressive form of PH where repeated blood clots in the lung get stuck and clog the arteries, which develop scar tissue over time. As a result, the blood vessels become narrower and more clogged.

UNIQUE TREATMENT FOR RARE DISEASE

Travis needed pulmonary thromboendarterectomy (PTE) surgery, an extremely complex procedure performed with cardiopulmonary bypass to remove the clots. Allegheny General Hospital is a nationally recognized center for treating CTEPH because of its exceptional outcomes and the expertise of its specialists. It’s also one of only 20 centers across the country that perform PTE.

“By surgically removing the blood clots from arterial branches in the lungs, we could reverse his heart failure,” said cardiothoracic surgeon Candice Lee, MD, one of few surgeons in the U.S. trained to perform PTE. “PTE is the only treatment option to cure CTEPH. We’ve had highly successful outcomes with patients’ pulmonary pressures returning to normal and their quality of life improving dramatically very quickly.”

Approximately 63% of CTEPH patients are operable, according to the International Prospective Registry. Data from the registry also showed a three-year survival rate of 90% in those

receiving PTE versus 70% in those who did not have surgery.¹

Dr. Lee said that patients who are not candidates for PTE have other options at AHN, including balloon pulmonary angioplasty and long-term medication.

For Travis, he is getting back to his prime form. He has resumed his love of exercise and playing soccer with his three girls: Avery, 14; Amari, 11; and Avoni, 9. His wife Raelyn reflected on how challenging the last few years have been on their whole family.

“Just to think about our 9-year-old — she had a fully active dad for four years — is really hard to believe sometimes,” she said. “And now Travis is getting back to himself, and we’re just so grateful.”

Reach Dr. Lee at 412-913-9687 or at candice.lee@ahn.org.

90% three-year survival rate for those who have PTE performed.

63% of CTEPH patients are operable.

¹ <https://hcp.cteph.com/hcp/treatment/p-t-e-surgery>



Top-rated program

LUNG CANCER SURGERY PROGRAM NAMED NATIONAL LEADER

Lung cancer patients in western Pennsylvania needing a lobectomy can have it performed close to home by one of the most elite thoracic surgery programs in the country.

The Lung Cancer Surgery Program at Allegheny General and Forbes hospitals earned a distinguished three-star rating from the Society of Thoracic Surgeons (STS) for its patient care and lung cancer resection outcomes. It's one of only 16 programs in the country to earn this highest possible rating.

"This recognition is the result of great dedication, skill, and teamwork from everyone involved in our thoracic surgery program," said Benny Weksler, MD, system chief of Thoracic Surgery at AHN. "Working together, they have pushed AHN Thoracic Surgery to new heights of excellence in patient care."

The STS star-rating system is one of the most sophisticated and well-regarded overall measures of quality in health care, rating the benchmarked outcomes of cardiothoracic surgery programs in the United States and Canada.

The General Thoracic Surgery Database (GTSD) star ratings are derived by testing whether the participant's composite or domain score is significantly different from the overall STS average for lobectomy for lung cancer performed by GTSD participants. It contains more than 616,000 general thoracic surgery procedure records and has approximately 1,000 participating physicians.



BENNY WEKSLER, MD
System Chief of Thoracic Surgery

“The Society of Thoracic Surgeons congratulates STS National Database participants who have received three-star ratings,” said David M. Shahian, MD, chair of the STS Task Force on Quality Measurement.

“Participation in the database and public reporting demonstrates a commitment to quality improvement in health care delivery and provides patients and their families with meaningful information to help them make informed decisions about health care.”

IMPROVING OUTCOMES

A lobectomy involves removing an entire lobe of the lung, often because the patient has lung cancer, but sometimes for some benign conditions. Research has shown that patients who undergo lobectomy for lung cancer live longer compared to those who receive less aggressive treatments.¹

Lung cancer is the leading cause of cancer deaths in both men and women in the U.S. It is often not detected until it has reached an advanced stage, and the five-year survival rate is less than 20%. However, when diagnosed at the earliest stage, known as stage 1A, the average five-year survival rate is 92%.²

“Our patients come to us during a difficult time in their lives, and we are committed to caring for them not only with top expertise and the most advanced technologies, but also with great compassion,” Dr. Weksler said. “The three-star designation reflects this commitment to care for our patients in a multidisciplinary and holistic way, focused on quality and safety from diagnosis to treatment to survivorship.”

EXTENSIVE OFFERINGS

In addition to lung cancer, the experts at AHN’s Thoracic Surgery Program care for patients with esophageal cancer, tracheal cancer, mediastinal tumors, and mesothelioma.

They also specialize in treating noncancerous conditions, including hiatal hernia, myasthenia gravis, and collapsed lung.

When possible, the team uses robotic and minimally invasive surgical techniques, including video-assisted thoracoscopic surgery (VATS), to lessen the impact to patients’ bodies and reduce their recovery time.

AHN also recently began using the Ion™ Endoluminal System by Intuitive for lung biopsies. The robot-assisted platform lets physicians access hard-to-reach tumors and is a less invasive procedure than prior biopsy options.

“We can make a diagnosis by sampling tissue from small nodules in areas of the lung where previous tools and procedures were unable to access effectively,” Dr. Weksler said. “This is helping meet our goal of catching lung cancer at an early stage, so we can provide effective interventions and increase survival rates.”

Reach Dr. Weksler at 412-359-6137 or at benny.weksler@ahn.org.

¹ <https://www.sciencedaily.com/releases/2017/11/171130122808.htm>

² https://seer.cancer.gov/csr/1975_2017/

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Never miss a beat

VIRTUAL CARE GOING STRONG WITH CARDIAC PATIENTS

Virtual cardiology visits at AHN saw a major boost during the COVID-19 pandemic, as did many health systems across the country. Realizing the benefits of virtual health for both patients and physicians, AHN plans to permanently offer this care throughout the network.

"We are going to look back 20 years from now and wonder why it took us so long to get here," said Amit Thosani, MD, director of AHN Cardiac Electrophysiology. "Virtual visits have helped change the paradigm of how we care for patients because they are patient centric."

Virtual medicine has been around for more than a decade but never had such widespread adoption. After the pandemic peaked and things slowly returned to normal, patients continued requesting virtual appointments. They appreciate the time savings, convenience, and comfort of speaking with their providers from their homes.

"Expecting a patient to take time off work, maybe have someone else drive them to the appointment, travel hours to see a specialist, park in an unfamiliar place, sit in the waiting room, wait in the exam room — it's a lot to ask of people," Dr. Thosani said.

"There's an opportunity for us to do a better job, especially in cardiology. There's still great value to in-person in some circumstances, but just as much value with the virtual medicine platform for many patients."



AHN had
500,000
virtual visits in 2020,
+4,000% over 2019.



AMIT THOSANI, MD
Director of AHN Cardiac
Electrophysiology

A POSITIVE ALTERNATIVE FOR HEART PATIENTS

Virtual visits are well suited for electrophysiology because monitoring heart health remotely is increasingly possible.

Patients' pacemakers and defibrillators are checked remotely before a scheduled visit and the data is sent to physicians through the internet. Patients have also been using smartwatches, ECG devices, and mobile apps to record their heart rhythm.

**“We are going to look back
20 years from now and
wonder why it took us so
long to get here.”**

**— Dr. Amit Thosani,
Director of AHN Cardiac
Electrophysiology**

“It works very well in electrophysiology because we diagnose and treat based on three things: history, face-to-face conversation, and objective data,” Dr. Thosani explained. “With all the technology that patients have available to them, we can obtain this information while they’re relaxed and comfortable in their own homes.”

Dr. Thosani said post-procedure care has become better in many ways because of virtual care.

“If you’re recovering from surgery, it’s not easy to make it back to your doctor’s office. If you have a virtual visit instead, you’re face-to-face with your provider, there aren’t all the distractions of the office, and you don’t have the stress of having to get to the office.”

SUCCESS WAS JUST WAITING TO HAPPEN

Before the pandemic, virtual visits were put on the to-do list while more pressing issues were handled. But COVID-19 kicked it into high gear, and AHN rose to the occasion.

“All the infrastructure has been in place for years, but the implementation from traditional to in-person visits really was remarkable and occurred almost overnight,” Dr. Thosani said.

AHN had nearly 500,000 virtual visits in 2020, a 4,000% increase over the 2019 volume. The highest specialty was primary care with 44%. Cardiology started off strong with 6% and continues to grow.

A positive aspect of the virtual health growth was recently highlighted in a Cedars-Sinai study.¹ It found that minorities and underrepresented populations took advantage of virtual health to meet with their care providers for cardiovascular services during the pandemic.

“We have improved patient access and grown our outpatient practice using virtual visits. We can see people four hours away in a rural area, those in underserved areas, and even patients across the country,” Dr. Thosani said.

“Just yesterday, I was asked to see a new patient. I was able to look over her records and have a virtual visit that same day instead of what could have taken weeks or months for an in-person appointment. We are excited to use virtual visits to improve access and shorten the time to provide the care our patients need.”

**Reach Dr. Thosani at 412-359-3457
or at amit.thosani@ahn.org.**

¹ <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2778152>





RAHMESHA BUCHANAN
Patient



Equity in heart health

THE SOCIAL DETERMINANTS OF LIVING A HEALTHY LIFE

Talking one March afternoon with Rahmesha Buchanan about growing up on the Northside of Pittsburgh, she didn't complain once.

The 44-year-old described losing her father and older brother to heart disease and the lengths her mother worked to provide for her family.

Then when Rahmesha was just 22, her mother, a lifetime smoker, died from cancer. Always putting others before herself, she began working to care for her four brothers. At a fairly young age, she turned to cigarette smoking to cope with the stress that she inherited. It led her to develop high blood pressure and high cholesterol.

A decade later, Rahmesha became a single mother to her daughter. She worked multiple jobs — food kitchens, grocery stores, and a center for disabled children. Then in 2019, the COVID-19 pandemic left her without a job, and unemployment took a toll on her and her daughter.

Rahmesha said her daughter, now 10, remained a happy, carefree kid even during the toughest of times. That's surely a nod to Rahmesha's commitment to keeping her troubles and burdens away from her daughter's view and focusing on providing her with opportunities she never had herself.



Anita Radhakrishnan MD
Cardiologist

DR. ANITA RADHAKRISHNAN
Cardiologist

HEART DISEASE HITS HER NEXT

In early 2019, Rahmesha began having chest discomfort, but thought it was heartburn. Her doctor treated her for acid reflux, but the pain progressed significantly over time.

"The burning in my chest felt like someone lit a match, and I swallowed it," Rahmesha said. "I couldn't even walk a few steps without that burn. I would regurgitate from the pain, and I had to stop working. I couldn't do the things with my daughter that she wanted me to."

One night, she went to Allegheny General Hospital's Emergency Department, where she was given cardiac testing and a stress test. Rahmesha was diagnosed with coronary artery disease and began taking medication to treat it.

She continued having symptoms, so Rahmesha began seeing AHN cardiologist Anita Radhakrishnan, MD, at the AHN Women's Heart Center. She subsequently underwent a coronary angiogram that showed one of her coronary arteries was blocked 95%. She had angioplasty with stent placement and began taking five new medications.

"It has become widely accepted that social determinant factors also contribute to a person's risk of heart disease."

**— Dr. Radhakrishnan,
Cardiologist**

Rahmesha continues dealing with her everyday struggles, but she's paying more attention to her health. She developed a relationship with Dr. Radhakrishnan, who has educated Rahmesha about how to keep her heart healthy and remain active for her daughter.

"Over the last year, Rahmesha has prioritized her health," Dr. Radhakrishnan said. "She has been working on quitting tobacco use, eats healthier, has been more physically active, and monitors her vitals and symptoms at home and reports them to us in a timely manner."

THE INFLUENCE OF HEALTH INEQUITIES

Dr. Radhakrishnan said Rahmesha's story sheds light on how cardiovascular disease doesn't result only from traditional inherited and acquired risk factors. While she had family history for heart disease and carried traditional risk factors, such as smoking, high blood pressure and high cholesterol, she had numerous social and personal risks that were likely causal factors for heart disease.

"It has become widely accepted that social determinant factors also contribute to a person's risk of heart disease," Dr. Radhakrishnan said. "Rahmesha had a number of them, including challenges with her socioeconomic status, adverse childhood experiences, lack of social support, difficulty with employment and limited health care access, all of which contributed to her developing heart disease at a young age."

Dr. Radhakrishnan said the first step in addressing these determinants is awareness that patients deal with these challenges and that heart health is not equal.

"We need to identify patients at high risk of cardiovascular disease and implement preventive measures early. However, for preventive measures to be effective, the social determinants of health that impede the achievement of ideal lifestyle factors and clinical factors must be tackled."

**Reach Dr. Radhakrishnan at
412-359-3725 or at
anita.radhakrishnan@ahn.org.**

In the News

AHN CVI INNOVATIONS DINNER

AHN held an “Innovations in Cardiovascular Medicine and Surgery” dinner in Pittsburgh in March, with a livestream to Erie. More than 50 physicians attended the event hosted by AHN CVI co-chairs Stephen Bailey, MD, and Srinivas Murali, MD.

Featured panel and topics were:

- Applications of Cardiac PET Imaging: Indu Poornima, MD
- Latest Advances in Conduction System Pacing: Tharian Cherian, MD
- Innovations in Heart Failure Device Therapy: Matthew Lander, MD
- Surgical Navigation in Vascular Surgery with IOPS: Satish Muluk, MD
- Noninvasive Radioablation for Ventricular Tachycardia: Amit Thosani, MD
- Advances in Coronary CT Angiography: Moneal Shah, MD
- CTEPH Medical and Surgical Management: Manreet Kanwar, MD, and Candace Lee, MD

AHN WELCOMES NEW SPECIALISTS

Mahathi Indaram, MD

Dr. Indaram is a cardiologist who specializes in cardiac disease prevention, coronary artery disease, cardiac imaging, and women’s heart health.

She attended medical school at JSS Medical College in Mysore, India, and completed her residency at the University of Missouri-Kansas City School of Medicine in Kansas City, Missouri. She completed a fellowship in cardiovascular disease at Allegheny General Hospital.

Dr. Indaram’s recruitment allows the Cardiovascular Institute at AHN to expand its services for women’s heart disease, including the establishment of a Women’s Heart Clinic at West Penn Hospital.

Michael Popeck, DO

Dr. Popeck is a cardiologist who specializes in coronary artery disease, aortic disease, cardiac imaging, and cardiac intensive care.

He attended medical school at Lake Erie College of Osteopathic Medicine in Erie, Pennsylvania, and completed a residency and cardiovascular disease fellowship at Allegheny Health Network.

Dr. Popeck’s recruitment allows the CVI at AHN to expand its multidisciplinary thoracic aortic disease program at Allegheny General Hospital.

Ryan Watson, MD

Dr. Watson is an interventional cardiologist who specializes in coronary and structural interventions, as well as peripheral vascular disease.

He attended medical school at Jefferson Medical College, Thomas Jefferson University, in Philadelphia, Pennsylvania, and completed residency at Brigham and Women’s Hospital in Boston, Massachusetts. He also completed a fellowship in cardiovascular disease at Thomas Jefferson University Hospital and a fellowship in interventional cardiology at Brigham and Women’s Hospital.

Dr. Watson’s recruitment allows AHN to expand its coronary and structural heart interventional services at Allegheny General and Jefferson hospitals.

AHN Cardiovascular Institute locations

**TO REFER A PATIENT, PLEASE CALL
1-844-MD-REFER (637-3337)**

AHN Cardiovascular Institute — Allegheny General
320 East North Ave.
Pittsburgh, PA 15212

AHN Cardiovascular Institute — Belle Vernon
1533 Broad Avenue Ext.
Belle Vernon, PA 15012

AHN Cardiovascular Institute — Butler
103 Technology Dr.
Butler, PA 16001

AHN Cardiovascular Institute — Canonsburg
100 Medical Blvd.
Canonsburg, PA 15317

AHN Cardiovascular Institute — Clairton
1200 Brooks Lane
Clairton, PA 15025

AHN Cardiovascular Institute — Coraopolis
995 Beaver Grade Rd.
Coraopolis, PA 15108

AHN Cardiovascular Institute — Forbes
2626 Haymaker Rd.
Monroeville, PA 15146

AHN Cardiovascular Institute — Greensburg
6321 Route 30
Greensburg, PA 15601

AHN Cardiovascular Institute — Grove City
631 North Broad St. Ext.
Grove City, PA 16127

AHN Cardiovascular Institute — Jefferson
Medical Oncology South Hills Medical Building
575 Coal Valley Rd.
Jefferson Hills, PA 15025

AHN Cardiovascular Institute — New Kensington
2781 Leechburg Rd.
New Kensington, PA 15068

AHN Cardiovascular Institute — Natrona Heights
1600 Pacific Ave.
Natrona Heights, PA 15065

AHN Cardiovascular Institute — Saint Vincent
2315 Myrtle Street
Erie, PA 16502

AHN Cardiovascular Institute — Uniontown
97 Delaware Ave.
Uniontown, PA 15401

AHN Cardiovascular Institute — Waterworks
970 Freeport Rd.
Pittsburgh, PA 15238

AHN Cardiovascular Institute — West Penn
4815 Liberty Ave., Mellon Pavilion
Pittsburgh, PA 15224

Bethel Park Health + Wellness Pavilion
1000 Higbee Dr.
Bethel Park, PA 15102

Erie West Side Health + Wellness Pavilion
4247 West Ridge Rd.
Erie, PA 16506

Heritage Valley Medical Group
Heart and Vascular Center
605 Sharon Rd.
Beaver, PA 15009

Peters Township Health + Wellness Pavilion
160 Gallery Dr.
McMurray, PA 15317

Richard G. Laube Cardiovascular Center
1 Nolte Dr.
Kittanning, PA 16201

Wexford Health + Wellness Pavilion
12311 Perry Highway
Wexford, PA 15090



120 Fifth Ave.
Pittsburgh, PA 15222

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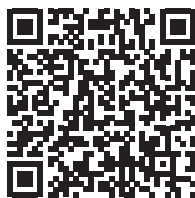
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