This publication represents the allied efforts of the state’s largest university and largest health system to improve the health of West Virginians and all we serve.

The WVU gold and blue is one of the most recognizable brands in the state. We want that brand to stand for excellence in healthcare, so that people entering any clinic under those colors know that they are receiving the best care.

Our success depends on our partnerships with our regional hospitals and strongly aligned partners. In a state as rugged and rural as West Virginia, having roots in communities is the only way to make care accessible to those who need it.

Think of WVU Medicine as a wheel. Our regional hospitals and partners are the spokes that connect us to people who need care. From the hub in Morgantown, we support them with the resources, research, and expertise of a 645-bed academic medical center and the five schools of the WVU Health Sciences. Together, we have the tools and access to deliver excellent healthcare throughout the state.

We’ve been busy this year. From tackling systemic issues affecting our state and nation, such as opioid abuse, to pushing the bounds of medical knowledge and practice in our newly opened WVU Heart and Vascular Institute, we’re excited to show you what we’ve been doing.

Albert Wright (right), President and CEO, WVU Medicine-West Virginia University Health System
Judie Charlton, MD (left), CMO, WVU Medicine
Clay Marsh, MD (center), Vice President and Executive Dean, WVU Health Sciences

West Virginia University Health Sciences
School of Medicine
School of Nursing
School of Pharmacy
School of Dentistry
School of Public Health

HEALTH CAMPUSES
Morgantown
Charleston
Martinsburg

West Virginia University Health System
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Faculty Representative
Julie Merow
Student Representative

Jeffer son Medical Center in Ranson prepares to raise the gold and blue over its building in December.
West Virginia has a health problem. The state has high rates of heart disease, diabetes, kidney disease, obesity, and other health issues, as well as negative lifestyle factors such as smoking and poor nutrition.

The mission of WVU Medicine is to improve the health of West Virginians and all it serves. This means not only providing the most advanced tertiary and quaternary care when people are sick but also connecting people with health resources and access to preventive care.

Clay Marsh, MD, vice president and executive dean of WVU Health Sciences, said, “Our best resource for this is the quality and commitment of our WVU Medicine team to provide meaningful connections, hope, safety, and trust to the citizens of West Virginia.”

With 10 hospitals stretching across northern West Virginia and western Maryland and clinics stretching to the southernmost tip of the state, WVU Medicine is building a network of primary and specialty care such that no West Virginian should need to leave the state to receive care. Many out-of-state patients already travel into the state to access advanced treatments.

That patient care is supported by basic and clinical research out of the WVU Health Sciences Center. Through participation in international clinical trials as well as advancing medical and public health knowledge both in the lab and in the field, WVU Medicine is pushing the boundaries of modern medicine to bring the best to its patients.

“We are at an exciting time in our organization when we can bring together the right people with the right facilities and the right resources, and we’re seeing the fruits of that,” Albert Wright, president and CEO of WVU Medicine-West Virginia University Health System, said. “We’re growing rapidly to keep up with demand for our services. We built a tower adding more than 150 beds, and it was full before it was officially open.”

On the horizon is only more growth as WVU Medicine pursues developing its specialized institutes, as well as expanding its footprint of outreach clinics and partner hospitals. From prevention to the most advanced specialty care, WVU Medicine is bringing the best in healthcare to West Virginia.
exanding to serve

WVU Medicine is growing — including expanding and upgrading our physical footprint to better serve our patients.

Expansion and improvement in 2016

MORGANTOWN
- J.W. Ruby Memorial Hospital Southeast Tower
- Physician Office Center renovation (Phase 1)
- Emergency Department renovation (Phase 2)

FAIRMONT
- Fairmont outpatient clinic, opening September 2017

BRIDGEPORT
- Remodeled oncology suite

KEYSER
- Medical Office Building
- Additional operating room suite
- Building renovation for wound care and diabetic services

GLEN DALE
- WVU Cancer Institute at Reynolds Memorial Hospital, opening 2017

PARKERSBURG
- Emergency Department at Camden Clark Medical Center

MARTINSBURG
- New progressive care unit at Berkeley Medical Center
- The Pharmacy at Berkeley Medical Center (retail pharmacy)
- Berkeley Medical Center North Wing building shell for future expansion
- Second MRI at Tennessee Avenue Medical Office Building

Reynolds Memorial Hospital joins WVU Medicine family

Reynolds Memorial Hospital became the eighth hospital — and the first in West Virginia’s Northern Panhandle — to join WVU Medicine. The new relationship was celebrated with a ribbon-cutting ceremony on October 3, 2016.

“What makes this day so special for all of us is to not only be able to welcome Reynolds Memorial Hospital into the WVU Medicine family but to continue to recognize and build on the opportunity to serve as healthcare providers of this great state,” Albert Wright, president and CEO of WVU Medicine-West Virginia University Health System, said.

The addition of the 90-bed acute-care hospital allows WVU Medicine to deliver top-quality care to residents who previously had to travel long distances, often outside of West Virginia, for advanced care.

David F. Hess, MD, CEO of Reynolds, said the event marked “the coming together of three entities: Reynolds Memorial Hospital, WVU Medicine, and the community.” He said, “I can’t think of a better partnership.”
What We Do

More than 90 percent of patient visits are from West Virginia, followed by Pennsylvania, Maryland, and Ohio. Our patient population hail from all 50 states and Puerto Rico.

**WVU Medicine patient reach by visit**

- **1,000–4,999** Virginia: 4,553
- **>30,000** Ohio: 33,071
- **Maryland**: 36,699
- **Pennsylvania**: 55,342
- **West Virginia**: 1,394,874

**Total**: 1,530,395

**Inpatient**
- Surgeries: 19,646
- MRI: 9,384
- Lab Services: 2,120,071

**Outpatient**
- Surgeries: 39,152
- MRI: 24,481
- Lab Services: 3,393,914

**5 Schools**
- **Public Health**: 164
- **Dentistry**: 310
- **Pharmacy**: 339
- **Nursing**: 781
- **Medicine**: 1,644

**Student Totals**
- 50 students

**Research Spending**
- $61,358,639

**A 60 Research Labs**

**8 + 2 Hospitals + Affiliates**

**4 Institutes**

**372 Residents + 46 Fellows + 1,150 Auxiliary Volunteers**

**1,110 Clinical Hours per Student**

**1,110 New hires in 2016**

**$61,358,639**

**50 Students**

**Medicine 1,644**

**Pharmacy 339**

**Dentistry 310**

**Public Health 164**

**Auxiliary Volunteers 1,150**

**Residents 372**

**Fellows 46**

**8,292**
Partnering with communities

Davis Health System
Elkins

A new partnership for specialty services between Davis Health System and WVU Medicine will provide a landscape for the highest quality and more efficient care for patients in the areas of cancer, cardiology, pulmonology, and vascular services.

The partnership established a WVU Heart and Vascular Institute clinic within Davis Medical Center’s new outpatient center, bringing access to advanced diagnostics, expertise, and resources in cardiology, pulmonology, and vascular care. In addition, the partnership will enhance medical and radiation oncology at the Davis Medical Center Cancer Care Center.

Grant Memorial Hospital
Petersburg

WVU Medicine Emergency Medicine physicians are now staffing the Emergency Department at Grant Memorial Hospital in Petersburg.

Grant Memorial Hospital is a not-for-profit critical access facility serving Grant, Hardy, Pendleton, Hampshire, and Mineral counties. It has 25 licensed inpatient beds and 20 long-term care beds. The hospital approached WVU Medicine about staffing its Emergency Department in 2015, and within nine months, WVU Medicine took on that role.

Wetzel County Hospital
New Martinsville

Wetzel County Hospital and WVU Medicine entered into a clinical affiliation in 2016 to better meet the needs of the people in the northern panhandle of West Virginia and the surrounding region.

The agreement builds on the relationship Wetzel County Hospital already has with WVU Medicine physicians at Reynolds Memorial Hospital in Glen Dale and will allow for the development of onsite specialty services, including cardiology, surgery, oncology, orthopaedics, and women’s health services.

It will also allow for increased clinical integration in areas such as emergency medicine and hospitalist-managed patients between Wetzel County Hospital and other WVU Medicine entities.
Fulfilling the mission

On June 23, 10 inches of rain fell on southeast West Virginia in 12 hours, causing flash floods that killed 23 people and destroyed more than 1,000 homes. West Virginia Gov. Earl Ray Tomblin declared a state of emergency for 44 of the state’s 55 counties.

Serving fellow West Virginians after devastating floods

Volunteers and donations poured into the flood-affected zone from all over, including from WVU Medicine, which quickly gathered a volunteer force to provide badly needed medical care. The WVU Medicine teams assisted local providers and clinics with basic medical care, tetanus immunizations, wound care, and wellness checks in homes.

Employees who couldn’t go in person sent support in the form of truckload after truckload of food, water, cleaning products, and other supplies. Employees at St. Joseph’s Hospital have raised nearly $1,000 for flood relief and continue collecting. Camden Clark Medical Center collected medical scrubs, and Berkeley Medical Center donated portable cribs. Several hospitals donated masks, gloves, and other basic medical supplies.

“Every time something was mentioned that someone needed – it appeared. We needed coolers – a truck pulled in loaded with them. People needed boots – they appeared. People just pulled into the parking lot and started barbecuing to feed anyone for free.”

- Mary (Cricket) Russell, RN, who traveled from Morgantown to provide medical aid in Rainelle

WVU School of Pharmacy student Rebecca Berhanu produced the song “West Virginia Strong” and donated 100 percent of the royalties to Dollars for Disaster. It is available for digital download on iTunes, Google Play, and Amazon.
Telestroke – WVU Stroke Center

Stroke is a leading cause of death nationally. Rapid evaluation and treatment is vital to preserving brain function. In a rural state, the nearest stroke center may be hours away.

WVU Telestroke Center partners with
school-based health centers

Nearly $1.2 million

from the Health Resources and Services Administration to collaborate with rural school-based health centers focusing on pediatric mental and physical healthcare in Barbour, McDowell, and Pocahontas counties and a community-based organization in Wyoming County.

High-risk maternal-fetal medicine

For women with high-risk pregnancies in Martinsburg, the only option used to be driving out of state or more than two hours to Morgantown for specialized care.

As of August, these women can see their regular providers at Berkeley Medical Center and receive specialty high-risk care via telemedicine.

Women can discuss their concerns during a monthly videoconference with a specialist based in Morgantown who can see her ultrasounds and vital signs electronically. A specialist also comes to Martinsburg once each month to provide any necessary in-person care.

Most women are able to deliver their children where they received their prenatal care, close to their homes and families, without having to travel out of state.
Second pediatric heart surgeon joins WVU Medicine Children’s

Fawwaz Shaw, MD, (left) assistant professor at the WVU School of Medicine, joined Robert Gustafson, MD, surgeon-in-chief at WVU Medicine Children’s and professor and chief of the WVU Division of Pediatric Cardiothoracic Surgery, in July 2016. Dr. Gustafson had been the only pediatric heart surgeon in West Virginia for more than three decades.

“Dr. Shaw came highly recommended by his mentors at Seattle Children’s Hospital,” Gustafson said. “They all felt he was one of the best fellows they had ever trained.”

Since 1984, Gustafson has treated close to 15,000 patients from across the state, country, and around the world. He said the timing for bringing on a second pediatric heart surgeon is right, especially with plans to increase the size of WVU Medicine Children’s both in terms of its physical footprint and the number of specialists and subspecialists available to treat patients.

WVU will partner with hospitals, medical practices, pediatric health programs, and others across the state to make the latest treatments available to children who need them.

The network will draw on existing partnerships, including the CARDIAC Project, the West Virginia Clinical and Translational Science Institute, and the Center for Oral Health Research in Appalachia.

Two other WVU faculty members, Lesley Cottrell, PhD, vice chair for research in the WVU Department of Pediatrics, and pediatric cardiologist Lee Pyles, MD, are co-leaders of the project. The WVU Schools of Dentistry, Medicine, and Public Health will participate as well.

A pediatric clinical trials network for West Virginia

Seriously ill children across West Virginia will have easier access to new medical treatments in their own communities thanks to a four-year, $1.8 million grant awarded to WVU by the National Institutes of Health (NIH).

“The NIH recognizes that parents of children in medically underserved and rural areas have difficulty gaining access to state-of-the-art treatments when their children are seriously ill,” said J. Philip Saul, MD, a WVU pediatric cardiologist, the study’s principal investigator, and executive vice president of WVU Medicine Children’s. “It’s often a long drive, or even requires an overnight stay, to visit WVU or another academic medical center. By building a pediatric clinical trials network across the state, we will give their doctors access to the same treatments that are available in Morgantown.”

WVU Medicine Children’s is the only hospital in the state performing this procedure, in which a surgeon severs both sides of the infant’s jawbone and places a device that gradually draws the front of the jaw forward, causing new bone to form in the gap and lengthening the jaw. It takes about 10 days to lengthen the jaw, eight weeks at home for the new bone to harden, and then the device is removed.

“Mandibular hypoplasia can be devastating for these infants,” Aaron Mason, MD, plastic and craniofacial surgeon at WVU Medicine Children’s and assistant professor at the WVU School of Medicine, said. “Providing this procedure at our hospital allows our littlest West Virginians to receive the care they need closer to home.”

Magnetic leg-lengthening implant gets teen active again

A four-wheeler ride in July 2011 took a terrible turn when 11-year-old Michael Duggan of Swanton, Maryland, unexpectedly wrecked his ATV. His father rushed him to the local hospital, which transferred him to the WVU J.W. Ruby Memorial Hospital Emergency Department. Under the care of pediatric orthopaedic surgeon and professor at the WVU School of Medicine John Lubicky, MD, Michael would become the first patient in West Virginia to undergo leg lengthening with a magnetic implant.

On the night of the accident, X-rays showed that Michael’s right femur was fractured, and the growth plate at the lower end of his right knee was also significantly damaged. Dr. Lubicky realigned the femur, secured the bone with large pins, and applied a cast. The leg would heal, but Michael would develop a leg-length discrepancy as he grew.

Lubicky told the family about the PRECICE Intra-medullary Limb Lengthening System, a new, less-invasive leg-lengthening procedure, where a magnetically driven implant is used instead of a bulky metal device worn on the outside of the leg.

“This new technology allows us to implant a rod with magnetic motors. You hold a magnet over top of the area several times a day, and it lengthens the bone,” Lubicky said. “It doesn’t hurt the child because we do it at such small amounts – a third of a millimeter three times a day. Parents can do this at home and are instructed on how to use the magnets.”

The family needed to wait a few years until Michael finished growing. By that time, there was a leg-length difference of more than two inches, and Michael had a limp and pain while walking. He was able to get the magnetic implant in November 2015.

Six years after the accident, Michael has been walking without crutches for more than a year, and he doesn’t feel any pain or notice the rod in his leg. He’s active in club sports again at his high school.

“It’s almost like it didn’t happen really,” Michael said. “I deal with pain a lot better. This made me stronger.”

“Mandibular hypoplasia can be a visibly short chin that pushes the normal-sized tongue to the back of the mouth, blocking the infant’s airway. In mild cases, simple interventions can move the tongue out of the way until the jaw naturally lengthens. In severe cases, a surgical intervention called mandibular distraction is needed.”

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luke Marone, advanced heart and vascular procedures to the Institute, on the Morgantown campus. The past year brought several including the opening of the new $200 million, 10-story tower in 2016 to drive the expansion of cardiovascular services, The WVU Heart and Vascular Institute welcomed new leadership Gordon F. Murray Professor and Chair, Executive Chair, WVU Heart and Vascular Institute.

The WVU Heart and Vascular Institute is the first in the state and one of only seven institutions in the United States and 25 worldwide to implant the Tendyne Bioprosthetic Mitral Valve. This device is placed into the tip of the heart using a catheter inserted through a small chest incision. The artificial valve is implanted over the existing valve in the state and one of only seven institutions in the United States and 25 worldwide to implant the Tendyne Bioprosthetic Mitral Valve. This device is placed into the tip of the heart using a catheter inserted through a small chest incision. The artificial valve is implanted over the existing valve and are at full recovery in four to six weeks.

**In.Pact in-stent restenosis**

In-stent restenosis (ISR) is when stenosis, or a narrowing of the artery, recurs after the narrowed artery had previously been treated with a stent. Vascular specialists at the WVU Heart and Vascular Institute are participating in a clinical trial using a drug-coated balloon to apply medication directly to the narrowed area to relieve and prevent ISR. This drug-coated balloon is FDA-approved to treat restenosis when a stent has not been used, but this trial explores expanding its use to patients experiencing ISR who have already received stents to treat atherosclerotic blockages in the superficial femoral or popliteal artery in the leg.

**WATCHMAN Left Atrial Appendage Closure Implant**

The WATCHMAN implant closes off the left atrial appendage (LAA) to reduce stroke risk for patients with atrial fibrillation (AF), a heart condition where the upper chambers of the heart (atrium) beat too fast and with irregular rhythm (fibrillation). Atrial fibrillation can cause blood to pool and form clots in the LAA that can travel to the brain, lungs, and other parts of the body. Implanting the WATCHMAN device closes off the LAA to keep blood clots from forming and potentially causing a stroke.

- **AF and Stroke**
  - 5x higher stroke risk for AF patients
  - 20% of all strokes occur in patients with AF
  - AF-related strokes are more frequently disabling or fatal

**Minimally Invasive Robotic Mitral Valve Repair**

Most mitral valve repair procedures at the WVU Heart and Vascular Institute are performed in a robotically assisted, minimally invasive manner. Surgeons operate through a small incision in the chest to repair and reinforce the mitral valve. Patients often return home within three to five days and are at full recovery in four to six weeks.

**Transcatheter Mitral Valve Replacement (TMVR)** with MitraClip

If a patient is too frail for mitral valve surgery, TMV is a less invasive alternative. In TMV, the MitraClip, the only FDA-approved TMV device currently available, is inserted using a catheter through the major leg vein and navigated through the beating heart to the mitral valve. The MitraClip pinches a portion of the valve closed to reduce MR.

**Transcatheter Mitral Valve Replacement (TMVR)** with Tendyne Bioprosthetic Mitral Valve

The most recent advance in heart valve care, is a new procedure that is still in development. Mitral valve prostheses are currently only being offered to patients as part of FDA-approved clinical trials.

**Minimally invasive direct coronary artery bypass (MIDCAB)**

MIDCAB allows surgeons to bypass a blocked coronary artery robotically through a few small incisions between the ribs on the left side. Unlike traditional bypass surgery, it does not require opening the chest or using a heart-lung bypass machine. The surgeons harvest a healthy artery or vein from elsewhere in the body and hand-stitch it to the blocked coronary artery, bypassing the blockage and allowing blood to flow freely.

**Advances in mitral valve care**

The WVU Heart and Vascular Institute specializes in mitral valve repair and replacement, offering procedures at the forefront of research and surgical practice.

Mineral regurgitation (MR) is a potentially serious condition in which the mitral valve, located between the two left chambers of the heart, leaks. Instead of ensuring that blood flows in only one direction, it allows blood to leak backward, causing extra burden on the heart and lungs.

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**ADVANCED HEART AND VASCULAR CARE**

WVU Heart and Vascular Institute is the #1 in the nation in overall cardiovascular disease prevalence of heart attacks.

- **7.8%** #1 in the nation in prevalence of heart attack or stroke.
- **13.7%** #1 in the nation in overall cardiovascular disease prevalence of heart attacks.
- **30.4%**

More than one-fourth of adults in West Virginia have been advised by a healthcare provider to take aspirin to reduce the chance of heart attack or stroke.

- **30.4%**

WVU Heart and Vascular Institute

The WVU Heart and Vascular Institute welcomed new leadership in 2016 to drive the expansion of cardiovascular services, including the opening of the new $200 million, 10-story tower on the Morgantown campus. The past year brought several advanced heart and vascular procedures to the Institute, including some that had never before been available in the state.

Vinay Badhwar, MD
Executive Chair, WVU Heart and Vascular Institute
Gordon F. Murray Professor and Chair, Dept. of Cardiovascular and Thoracic Surgery

Luke Marone, MD
Co-director, WVU Heart and Vascular Institute

Mohamad Alkhouri, MD
Brian Grose, MD
James D. Mills, MD
Bryan Raybuck, MD
George Sokos, DO
Lawrence M. Wei, MD

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Source: WVUHRP

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**WVU Heart and Vascular Institute surgeon Bryan Bush, MD, prepares for surgery in the operating room.**

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The WVU Medicine Center for Joint Replacement performed its first total hip replacement as an outpatient procedure in 2016, with total knee to follow soon.

“Which I think for total joints we can,” Dr. Lindsey said.

While outpatient total joint replacement can be done with traditional joint replacement surgery, the precision of robotic-assisted joint replacement contributes to the accelerated recovery protocols that allow patients to get literally back on their feet soon after surgery.

Miles got a new hip and went home the same day.

At age 26, Miles Cox, of Morgantown, needed both hips replaced due to ankylosing spondylitis, a severe form of arthritis.

“It used to be a struggle to walk across the room; it would be a struggle to get up to use the bathroom; it would be a struggle to do anything,” Cox said.

Cox had both hips replaced using robotic-assisted joint replacement. His second procedure was the hospital’s first outpatient total joint replacement.

“I was much more comfortable at home,” Cox said. “No one likes to sit there in the hospital all day.”

The improved longevity of robotically placed implants is particularly important for a young man like Cox.

“For a younger patient, putting those implants in as perfectly as we can is going to give him the most longevity and the least risk of some sort of mechanical complication,” Lindsey said. “And Miles recovered fantastically. I think he’s excited about what it offers him.”

“I literally everything is easier,” Cox said. “I could barely lift my legs before. Getting out of the shower is easier, getting dressed is easier, everything’s just a little bit easier.”

With robotic-assisted joint replacement, instead of attempting to manually execute a preoperative plan, the surgeon creates a preoperative plan based on the patient’s CT scans, and the plan is programmed directly into a robotic arm. The surgeon controls the arm through the surgery, and the arm ensures that the surgeon does not deviate from the plan.

This degree of precision allows implants to have fewer complications and last longer, so patients need fewer, if any, revision surgeries during their lifetimes.

Robotic-assisted joint replacement surgery virtually eliminates human error, resulting in procedures that are precise to within a millimeter. The improved longevity of robotically placed implants is particularly important for a young man like Cox.
Accessible cancer care
Community tumor board connects physicians across the state

A great strength of the WVU Cancer Institute is its broad portfolio of multidisciplinary clinical teams, also called tumor boards.

Each patient's case is brought before a team of experts specific to that cancer type. The room is filled with as many as 30 people representing all aspects of cancer care to discuss each patient's unique case and determine the best course of action.

The aggregated expertise of these disease-specific tumor boards is great for cancer patients, but for physicians at the WVU Cancer Institute's regional centers, it's difficult to remotely attend several specialty tumor boards each week.

"Our regional clinical partners told us it is not possible to attend so many tumor boards, so we listened. We created a single point of contact for our community cancer centers to consult with physicians at the Mary Babb Randolph Cancer Center in Morgantown," Hannah Hazard, MD, director of clinical services at the WVU Cancer Institute and associate professor of surgery at the WVU School of Medicine, said.

The community tumor board includes key physicians from each specialty. Off-site physicians can attend remotely to present patient cases for discussion, second opinion, or, if needed, referral for advanced care in Morgantown.

"Our goal is to offer the best care to all patients," Michael Craig, MD, section chief of Hematology/Oncology and leader of the WVU Cancer Institute, said. "By making our specialized expertise accessible cancer care".

Caring across the continuum of cancer

The WVU Cancer Institute was awarded two grants to help lung cancer patients at both ends of the cancer care spectrum, from screening to survivorship.

The Bristol-Myers Squibb Foundation has committed $25 million in new funding to former Vice President Joe Biden’s Cancer Moonshot Initiative to address healthcare disparities in cancer care and support.

Screening

The WVU Cancer Institute's Cancer Prevention and Control program established a partnership with the Patient Advocate Foundation in Hampton, Virginia, to address lung cancer disparities in West Virginia.

The major aim of the West Virginia Lung Cancer Program is to increase lung cancer screening among low-income and limited-resourced individuals across the Mountain State through a combination of comprehensive and coordinated provider outreach and engagement, public education and outreach, case management support, and evaluation.

Survivorship

The WVU Cancer Institute's survivorship program, "Bridge to Good Living: Thriving Beyond Lung Cancer," is designed to provide interdisciplinary, patient-centered survivor care services to all lung cancer patients who complete active treatment.

The program includes:
- Monitoring and managing physical and psychosocial symptoms
- Health promotion counseling, including smoking cessation, stress reduction, diet, and exercise
- Surveillance for cancer recurrence
- Development of treatment summary and care plans
- Navigation to community-based resources
- Educating providers to improve the care delivered to lung cancer patients

Starting up to shut down cancer

It's a long path from a Petri dish to the clinic, but Lori A. Hazlehurst, PhD, and her lab are taking an innovative approach to shorten it.

Dr. Hazlehurst, professor of pharmaceutical sciences and co-leader of the Alexander B. Osborn Hematopoietic Malignancy and Transplantation Program at the WVU Cancer Institute, is the president and co-founder of a startup company called Modulation Therapeutics that is devoted to moving effective treatments from the lab to clinical trials.

"It's a process of making sure it's safe, how you're going to manufacture it, how you're going to deliver it. All of that is very expensive," Hazlehurst said. "It's no longer discovery, so it's difficult to get an effective therapy for myelomas that are resistant to standard-of-care treatment."

Dr. Hazlehurst joined the WVU Cancer Institute in 2015. Her lab focuses on drug-sensitive and multiple myeloma, a blood cancer that can be treated but not cured. The survival time, sadly, is only about five years.

It’s a thought that standard of care doesn’t eliminate every cancer cell, so it starts to grow again, and what you end up with after a few treatments is a tumor that is very drug resistant,” Hazlehurst said.

By comparing drug-sensitive specimens to later drug-resistant specimens donated by generous patients, the team determined that their lead cancer-killing molecule, MTI-101, is more active in specimens obtained from patients who have relapsed while on therapy. Based on these results, MTI-101 may provide an effective therapy for myelomas that are resistant to standard-of-care treatment.

Hazlehurst joined the WVU Cancer Institute in 2015. Her lab focuses on multiple myeloma, a blood cancer that can be treated but not cured. The survival time, sadly, is only about five years.

World-renowned cancer expert leading WVU Cancer Institute

Richard M. Goldberg, MD, renowned gastrointestinal (GI) cancer expert, assumed the role of director of the WVU Cancer Institute on January 31, 2017.

Dr. Goldberg has held multiple National Cancer Institute-funded grants, and his research has resulted in more than 300 peer-reviewed publications. He has lectured worldwide on GI cancer topics and is well known as a mentor for junior colleagues who now serve in responsible academic leadership roles themselves. He came to WVU from Ohio State University’s Wexner Medical Center.
WVU Medicine physician leads international rural trauma course

Mortality for trauma cases is twice as high in rural areas as in urban areas. It takes longer to locate and reach a patient, and care centers are farther away.

WVU Medicine trauma experts travel the state to offer the Rural Trauma Team Development Course (RTTDC), developed by the American College of Surgeons (ACS) Committee on Trauma. This internationally offered course trains critical access hospitals to quickly stabilize the patient, identify if the patient requires transport to a higher level of care, and work efficiently as a team.

Alison Wilson, MD, director of the WVU Critical Care and Trauma Institute and Skewes Family Chair for Trauma Surgery, is also the national chair of the ACS RTTDC Committee. She and David Borgstrom, MD, associate professor and chief of the Division of General Surgery at the WVU School of Medicine, are two of the 11 authors of the most recent course manual.

“RTTDC is exceptionally important to aid and provide additional practice and education to the front-line people that staff the small critical access hospitals,” Dr. Wilson said.

Preston Memorial Hospital in Kingwood hosted its second RTTDC session last year. To Fred Conley, MD, chief of medical staff at Preston Memorial, the course not only provides the latest trauma care instruction but also facilitates valuable networking.

“If any one part of the team hadn’t come together like they did, Mr. Eckenrode’s outcome could have been very different,” Alison Wilson, MD, director of the WVU Critical Care and Trauma Institute and a key physician in Eckenrode’s case, said.

By all measures, there have been very few survivors of a trauma on this magnitude. His survival was only possible through the superior work and diligence of the entire staff and physicians.”

Around 300 people provided care to Kevin during his first 72 hours, including several who weren’t on call but came from home anyway due to the severity of the case.

It was Friday when Eckenrode arrived at the Trauma Center. On Monday, he was off the ventilator, and on Tuesday he took his first steps with a walker and ate some ice cream. After several weeks in a rehab facility, he celebrated Thanksgiving and Christmas at home with his family.

“He had a small percentage of a chance for survival that night, and we really thought that he was going to die,” said Kathy Eckenrode, Kevin’s wife. “We are forever grateful to Ruby hospital and the doctors here.”

Left: Kevin Eckenrode, just a few days after his accident, poses with clinical staff. Right: front and rear X-rays show the damage to Eckenrode’s pelvis.

Back from the brink

More than 200 units of blood needed after severe boating accident

On July 29, 2016, Kevin Eckenrode was enjoying himself at a family reunion at Deep Creek Lake in Maryland when a horrible accident occurred. While in the lake, he drifted under the boat and was struck by the propeller multiple times.

His injuries were massive. His pelvis was in multiple pieces, and he was eviscerated.

Eckenrode was airlifted to the WVU Medicine Jon Michael Moore Trauma Center in Morgantown, a nationally designated Level I trauma center, where he received 229 units of blood products – 28.6 gallons of blood, plasma, and platelets – in the first eight hours.

In the operating room, trauma and orthopaedic surgeons tried to control his bleeding. Interventional radiologists then performed a pelvic embolization to stop pelvic bleeding, and Eckenrode returned to the OR, where surgeons recreated his pelvis to stop the venous bleeding. He experienced acute renal failure, which was anticipated due to his injuries, and a nephrology team came in at midnight to perform dialysis so he could return to the OR for further reconstruction of his pelvis and left side.

“Leading healthcare here and everywhere

WVU critical care and trauma Institute

WVU Medicine.org

Volume 1 / 2017
WVU Critical Care and Trauma Institute

Future Green Berets receiving medical training at WVU Medicine

WVU Medicine is the first academic medical center in the country to partner with the US Army Special Forces, also known as the Green Berets, to host clinical rotations for soldiers training to become Special Forces Medical Sergeants.

WVU Medicine celebrated the one-year anniversary of a partnership with the US Army Special Forces which brings small groups of soldiers to Morgantown for 28-day training periods several times throughout the year. The partnership is led at WVU Medicine by George Bal, MD, WVU Medicine orthopaedic surgeon, WVU School of Medicine associate professor, and combat-serving veteran with the 82nd Airborne, and Alison Wilson, MD, director of the WVU Critical Care and Trauma Institute and Skewes Family Chair for Trauma Surgery.

The training is part of the army’s Special Forces Qualification Course. By the time they arrive in Morgantown, the soldiers going through the course have already completed extensive training in laboratory, veterinary, and surgical medicine and are considered among the highest trained trauma medics in the US military inventory.

While at WVU Medicine, these soldiers work in a variety of clinical areas, including obstetrics, pediatrics, oral and maxillofacial surgery, nursing, anesthesiology, general surgery, emergency medicine, and otolaryngology.

After graduating from the Special Forces Qualification Course, these new medics will be assigned to an Operational Detachment Alpha and deployed to the most austere locations in the world. They are typically solely responsible for the care of their teammates and the indigenous forces they train. The Special Forces medic will most often be the highest trained medical provider available.

According to former Special Forces Medical Sergeant Course Director Maj. Steve McKellar, “A strong foundation of medical knowledge is imperative to ensure a medic’s success, and the medical staff at WVU is helping us provide that.

“The quality of training at WVU is unmatched, and it has quickly become the most sought-after training site amongst the students, for good reason.”

On March 15, WVU Medicine and representatives from the US Army Special Forces gathered in Morgantown to recognize the one-year anniversary of the partnership.

“It certainly has been an honor and privilege to work with this program, and I will consider this to be one of my crown jewels of my entire career,” Dr. Wilson said.

At the ceremony, several WVU faculty members were awarded adjunct faculty status at the John F. Kennedy Special Warfare Center and School at Fort Bragg, North Carolina.

“At the military, we are recognized as one of the premier medical training centers in the Department of Defense,” Col. Shawn F. Kane said at the event.

“We can’t do what we do, and we would not be as good as we are, without people like you here at West Virginia University.”
‘I could have been dead.’
Clinical trial for brain aneurysm treatment saves man’s life

As a former emergency medicine physician, Rajan Masih, MD, 52, of Petersburg, knew exactly how bad his brain aneurysm was. In the ER, I treated so many people who had ruptured aneurysms,” he said. “I intubated them and put them on life support. Fifty percent of them died, and the other half were impaired for life. I was just so afraid.”

Fortunately, interventional neuroradiologists at WVU Medicine J.W. Ruby Memorial Hospital specialize in minimally invasive treatment for complex brain aneurysms like Dr. Masih’s. The team is one of only a few in the country selected to participate in the clinical trial for the WEB Aneurysm Embolization System. It looks like a small metal basket and is inserted with a catheter through an artery from the groin and into the brain. The device seals off the aneurysm, keeping the blood vessel intact.

“The WEB device is a significant evolution in the treatment of brain aneurysms,” Ansaar Rai, MD, WVU Medicine neuroradiologist, professor in the WVU Department of Radiology, and principal investigator for the WEB device clinical trial, said. “We are pleased that our team is frequently selected to be a part of specialized trials and that we can offer novel treatments years before their commercial release. It keeps us and WVU Medicine at the forefront of clinical medicine and research.”

The day before the surgery, Dr. Rai and his neurointerventional team practiced for hours on an exact replica of Masih’s brain aneurysm they created and attached to a mechanical heart pump. The live procedure took 20 minutes, and an hour later, Masih was in the intensive care unit sitting up in bed, drinking a soda, and walking around. “I could not have asked for better care anywhere,” Masih said. “It could have been dead, and they have, literally, given me another chance at life.”

WVU Stroke Center

The WVU Stroke Center received the 2016 Get With The Guidelines-Stroke Gold Plus Achievement Award with Target: StrokeSM Honor Roll Elite Plus. The Stroke Center has been a Gold Plus recipient for seven years.

Door-to-Needle times

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Patients treated with IV tPA in under 45 minutes

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Neurological Critical Care Unit opens at Ruby

A dedicated Neurological Critical Care Unit (NCCU) opened in January at J.W. Ruby Memorial Hospital. The unit includes 10 beds staffed by fellowship-trained neurointensivists who specialize in identifying and treating neurologic disease.

Patients are known to do better in a specialized unit under the care of staff who are trained and experienced in that field. Neurological intensive care units are a novel concept in healthcare, only recently becoming common in academic medical centers around the nation.

“Neurologic disease is something we don’t have good tests for other than having someone at the bedside who knows what they’re looking at. The main thing that we bring is that expertise in examining the patient,” said Matthew Smith, MD, director of neurocritical care.

Opening the NCCU is the last piece needed to achieve the designation of Comprehensive Stroke Center from the Joint Commission, a goal the Center hopes to achieve in 2017. The WVU Stroke Center already functions much like a Comprehensive Center, which meets standards for the most complex stroke cases and is prepared 365 days a year to deliver advanced stroke care.

Comprehensive is the highest of three stroke designations certified by the Joint Commission. In October, WVU was evaluated by the Joint Commission as a Primary Stroke Center — its second-highest designation — and confirmed that it is in position to earn Comprehensive status soon.
Better collaboration = better care
WVU School of Nursing works to improve patient outcomes by strengthening interprofessional teamwork

Older adults and heart surgery patients are often at an increased risk for developing issues with day-to-day activities and complications during hospital stays. Faculty members from the WVU Schools of Nursing, Medicine, Pharmacy, and Public Health, working with physicians at WVU Medicine, have collaborated to evaluate a model that uses a team-based, patient-centered approach to care delivery.

Their work is part of a three-year research project, a $1.4-million grant from the Health Resources and Services Administration (HRSA) – one of only 26 awards given nationwide in 2015. By strengthening interprofessional collaboration among the various healthcare providers, the project is improving teamwork, the patient experience, and patient outcomes while also reducing costly complications from hospitalization.

The project’s goals include:
- enhancing health professionals’ teamwork skills;
- developing more collaborative partnerships among nurses, doctors, pharmacists, and other healthcare professionals in clinical units; and
- establishing a long-term approach to sustain the model.

Since receiving the grant, the team has hosted educational activities and real-life simulations for more than 120 healthcare professionals to build knowledge they could then apply to their working environments. The results, to date, have been positive. After presenting healthcare simulations where professionals from various backgrounds were tasked to work together to address patient care, the overwhelming majority (98 percent) reported a positive experience.

99.5% Overall satisfaction average score for the didactic course was 99.5 percent.

Members have presented findings from the study at numerous conferences around the nation.

New champions for coal miners’ health
For more than a year, coal miners in southern West Virginia had no local black lung specialist. In July 2016, three WVU Medicine Occupational Medicine specialists began seeing patients at the Cabin Creek Health Center in Dawes.

Black lung disease, or coal miners’ pneumoconiosis, is caused by inhaling coal dust. It gets its name from the fact that those who have the disease have lungs that are black in color instead of pink, the color of healthy lungs. In order to qualify, or coverage under the Federal Black Lung Program, which is overseen by the US Department of Labor Division of Coal Mine Workers’ Compensation, patients must be evaluated by a physician on the Division’s Approved Diagnostic Provider List.

“This is a much-needed service in the southern part of the state because there is a lot of pulmonary disease there,” Anna Allen, MD, WVU Medicine occupational medicine specialist and associate professor in the WVU School of Public Health, said. “These patients need access to treatment, and if they qualify, we want that treatment to be there for them.”

Allen, along with Chuanfang Jin, MD, and Charles Werntz, DO, also associate professors in the WVU School of Public Health, see patients at the Cabin Creek Health Center two days per month on a rotating basis with the goal of eventually increasing their coverage at the clinic.

WVUMedicine.org
Addressing opioid addiction

West Virginia leads the nation in opioid overdose deaths.

Addiction to opioids is a serious public health issue. WVU Medicine is committed to addressing the opioid problem in our state from all sides, from treating addiction to training doctors to prescribe responsibly.

41.5 DEATHS PER 100,000 in 2015

WVU Medicine Chestnut Ridge Center

The West Virginia model

The Comprehensive Opioid Addiction Treatment (COAT) program at the Chestnut Ridge Center has become a highly successful model for medication-assisted opioid addiction treatment. The COAT model has gained national attention, known to many as simply “the West Virginia model.”

The program, which was developed at Chestnut Ridge, combines group therapy, individual therapy, peer support groups such as Narcotics Anonymous, and Suboxone (buprenorphine and naloxone). By providing structured peer support, addressing motivations for drug use, and using medication to suppress symptoms of addiction, this model has helped hundreds of people enter recovery and build productive lives since it began in 2005.

In 2016, the program opened an additional location to increase access to this evidence-based treatment. Chestnut Ridge addiction specialists have also traveled the state training providers and supporting them through teleconferencing.

- Weekly group medical and psycho-educational treatment
- 30 minutes of medical group
- One hour of group psycho-educational therapy
- Four peer support group meetings per week
- Monthly individual therapy appointments
- Suboxone

WVU School of Pharmacy

Safe and Effective Management of Pain Guidelines

In 2015, West Virginia once again ranked first nationally with the highest rate of opioid drug overdose, while the management of patients in pain continues to be difficult. To improve patient care, 20 pain management experts in West Virginia came together in July 2015 and formed the West Virginia Expert Pain Management Panel to tackle these issues affecting our communities.

Mark Garofoli, PharmD, assistant professor and pain management specialist in the WVU School of Pharmacy, coordinated the panel in creating the West Virginia Safe and Effective Management of Pain (SEMP) guidelines for prescribers and dispensers.

The guidelines, which follow and build upon the CDC Guideline for Prescribing Opioids for Chronic Pain released in 2016, were created with the experience and expertise of healthcare professionals throughout the state. The guidelines include a risk-reduction strategy and clinical treatment algorithms which will facilitate the best overall care for patients.

WVU Medicine Reynolds Memorial Hospital

BreakThru medically supervised withdrawal program

Reynolds Memorial Hospital initiated BreakThru, a medically supervised withdrawal management program, in October 2015. During its first full year of operation, BreakThru admitted 201 patients.

This voluntary program assists patients through the very difficult experience of withdrawal and then places them into intensive outpatient programs.

Tackling addiction head on

- Reynolds partners with the Marshall County Board of Education to co-sponsor drug-free clubs at each of the county’s high schools and middle schools.
- Reynolds provides needle boxes to all police and fire agencies throughout the county to ensure the safe disposal of hypodermic needles.
- Reynolds is participating in a WVU School of Pharmacy study to provide a five-minute educational encounter with a pharmacist in the emergency department for patients being discharged with an opioid prescription.

WVU Medicine

WVU School of Public Health

WVU trains police officers in naloxone use

Approximately 195 police officers have received training on opioid overdose recognition and naloxone administration since November 2015 through a collaboration between the WVU Injury Control Research Center and the David and JoAnn Shaw Center for Simulation Training and Education for Patient Safety. These officers represent eight different police departments in Monongalia, Marion, and Harrison counties.

To date at least 16 overdose reversals have occurred due to the administration of naloxone from one of these agencies.

WVU School of Medicine

West Virginia University offers courses to reduce opioid use

WVU has added a new online course, “The Treatment of Pain and Addiction Utilizing Education and Proper Prescribing: The New Paradigm Continued.” The course fulfills the state’s requirement for training in avoiding diversion of prescriptions drugs into the illicit market and provides continuing education credit.

The program was developed through the WVU Health Sciences Center Continuing Education Program in partnership with the West Virginia Medical Professionals Health Program, the West Virginia State Medical Association, and the West Virginia Osteopathic Medical Association.

The course brings providers the same information that is already being taught to students in WVU’s health professions schools, said Norman Ferrari, MD, chair of WVU’s Department of Medical Education.
Dare to C.A.R.E. free screening at UHC

United Hospital Center is the only hospital in the state chosen to partner with the Heart Health Foundation to provide free vascular disease education and screening.

The Dare to C.A.R.E. program screens for abnormalities that cause the following diseases:

**C**
- **Carotid artery disease**, which is responsible for at least 300,000 strokes per year

**A**
- **Abdominal aortic aneurysms**, the third leading cause of sudden death in men 60 or older

**R**
- **Renal artery stenosis**, which affects more than 5 million Americans

**E**
- **Extremity artery disease**, which affects more than 10 million Americans

If caught early, vascular disease can be treated to prevent serious problems, such as heart attack, stroke, amputation, or even death.

Since the program’s start in 2000, Dare to C.A.R.E. has screened more than 100,000 patients nationally, saving and improving thousands of lives.

Screenings offered twice a week
- 15-minute noninvasive ultrasound of the neck, abdomen, and legs
- Results shared with the patient and sent to his or her doctor

Free screenings for:
- **Anyone over age 60**
- **Anyone over age 50 with high risk factors**
- **Anyone over age 40 with diabetes**

A legacy of compassion for West Virginia’s eyes

The family of Rizal Pangilinan, MD, recognizes the importance of honoring his legacy and supporting the future of eye care in West Virginia.

Dr. Pangilinan worked as an ophthalmologist for many years at the Wheeling Clinic Eye Institute. Since his passing in 2002, his family has generously donated to the WVU Eye Institute’s Clinical Outreach Fund, which supports eye care for patients in underserved areas of West Virginia.

The family also established the Rizal Pangilinan Lectureship to make others aware of the difficulties faced when treating patients with eye problems in rural or hard-to-access parts of the state and even internationally.

“Rizal’s life was dedicated to caring for others in need,” said Judie Charlton, MD, chief medical officer of WVU Medicine and the Judie F. Charlton Chair for Glaucoma Outreach at the WVU Eye Institute. “The Pangilinan family’s continued support has made a tremendous impact on medically underserved areas in West Virginia. Through funds like the ones the Pangilinans support, we are able to improve the lives of thousands of patients in remote communities in the state and region.”

Berkeley Medical Center wound center receives national recognition

The Center for Wound Care and Hyperbaric Medicine at WVU Medicine Berkeley Medical Center is the first hyperbaric medicine center in West Virginia to receive national accreditation by the Undersea and Hyperbaric Medical Society (UHMS).

Hyperbarics is a treatment modality in which the entire body is exposed to oxygen at increased pressures. It is beneficial in getting oxygen to the areas of the body that are oxygen deficient.

“We offer treatment locally for patients with chronic wounds, which are wounds that do not heal,” Robert Bowen, MD, medical director for the Center, said. “For most of us, a minor cut or scratch poses little problem. However, there are many people who do not have the ability to heal properly due to poor blood circulation, diabetes, or other chronic problems. For these individuals, a simple sore or cut can result in serious infections, gangrene, or even amputation.”

“Arthur’s family has met the high performance standards required for UHMS accreditation. Only a little more than 100 HYPERBARIC CENTERS in the United States have met the high performance standards required for UHMS accreditation.¢

“Achieving UHMS accreditation means that we have met the most vigorous industry safety standards, practice evidence-based medicine, and have high ratings in patient outcomes and satisfaction,” Ginna Treadwell, RN, director of the Center for Wound Care and Hyperbaric Medicine, said.
WVU Dentistry to build Innovation Center

The WVU School of Dentistry has been selected by the Center for Research & Education in Technology (CRET) as one of only three schools in the United States and Canada to host an Innovation Center for dental students and practicing dentists.

The Innovation Center will simulate a private practice, with fully functional dental care units, auxiliary equipment for the newest restorative techniques, and the latest digital imaging technology. The Center will feature some of the most advanced dental technology available from manufacturers to enhance the student and patient experience.

“We are excited to enhance our dental curriculum with new technology and equipment, brought to us by CRET and dental manufacturers, that will enhance our students’ training and clinical experience,” WVU School of Dentistry Dean Anthony T. Borgia, DDS, MHA, said. “With this new Innovation Center, our students will receive an unrivaled learning opportunity and be exposed to a variety of equipment and technology that will help them make informed equipment decisions in private practice as they prepare to deliver the best in modern dental care to patients.”

Located on the second floor of WVU Dental Care in Suncrest Towne Centre, WVU’s CRET Innovation Center will also be available to alumni who would like to visit and observe equipment that they might otherwise not have the chance to evaluate.

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