Better Healing Through Technology

The Tiger Institute powers projects to help MU Health Care patients.
At MU Health Care, we strive to deliver high-quality, seamless care to patients across our hospitals and clinics. It’s just part of how we carry out our mission of saving and improving lives as an integrated academic health system. This integration wouldn’t be possible without robust information technology (IT) as the backbone to help us deliver the well-coordinated care our patients expect and deserve.

A decade ago, the University of Missouri partnered with Cerner Corporation, the Kansas City-based health information technology company, to form an IT team known as the Tiger Institute. The Tiger Institute oversees the information technology infrastructure essential to the care we provide patients every single day.

Today, the award-winning, public-private partnership has led to MU Health Care’s transformation into one of the nation’s most technologically advanced hospital systems.

And this technological advancement has real benefits for patients — whether it’s through the automatic alert that notifies medical providers when a patient is at-risk for sepsis; the HEALTHConnect online portal where patients conveniently manage appointments, request prescription refills and more; or the shared electronic health record that ensures patients transfer smoothly between MU Health Care and other facilities using the network, including Lake Regional Health System and, soon, Capital Region Medical Center.

As the health care and technology landscapes continue to change, it’s important we continue to innovate so patients receive leading-edge care. I look forward to the advances the Tiger Institute will make in the next decade so we can save and improve even more lives across mid-Missouri.

Thank you,

Jonathan Curtright
Chief Executive Officer
University of Missouri Health Care

At Boonville clinic, athletic trainers give area high schools professional care.

We are with screening and stent procedure, Boonville man escapes danger of aortic aneurysm.

Orthopaedics

Innovative technique eliminates painful complications for hip arthroscopy patients.

Outpatient knee and hip replacement surgery gets people home sooner.

School of Medicine

Researchers find yoga breathing exercises can reduce blood pressure.

School of Health Professions

Speech program helps Parkinson’s disease patients find their voice.

First Impressions

Trauma nurse spreads the word about injury prevention.

Family Medicine

Family medicine doctors take care of newborns, the elderly and everyone in between.

Cancer Care

Clinical trial helps Columbia woman overcome breast cancer and get back to family time.

Patient Experience

When patients at Children’s Hospital need a boost, Link the facility dog provides the motivation they need.

Technology

In 10 years, the Tiger Institute has transformed MU Health Care and made a difference in patients’ lives.

Alliance for Precision Health will help harness the power of Siemens equipment to transform patient care, research.

Sports Medicine

Athletic trainers at Boonville clinic give area high schools professional care.

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Features

MU Health is published for patients, employees and friends of University of Missouri Health.

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See the new MU Health Care Pavilion at the Columbia Farmers Market on page 23.

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MU Health

Megan Cram, RN, and Ben Wax, RN, were part of the team that implemented the National Early Warning Score alert system, which has helped University Hospital diagnose and treat patients with sepsis. That project is one of many powered by the Tiger Institute for Health Innovation, the IT team formed by Cerner and the University of Missouri 10 years ago.

Read more on page 10.
Child Life specialist calms fears of young patient

I am writing about a wonderful experience I had at Women's and Children's Hospital.

My son was admitted via the emergency room on June 12. He had to get an IV and has a severe fear of needles. We were introduced to Brittany Riley, a Child Life specialist, when we got to the hospital. I told her about my son’s past experience with a staph infection that led to therapy.

Brittany was outstanding. She coached him through every stage of the procedure, and I was blown away by how well my son was able to cope due to her support. She even stayed late to make sure she was by his side when he had the IV. It was past midnight, and they had to try three sites because the veins weren’t cooperating.

I was also very impressed with all of the residents, doctors and nurses we encountered during our stay. Each one treated us with care and attention. I never felt rushed, talked down to or discarded even though I’m sure there were many patients and issues to attend to.

Each interaction with my son was wonderful, and I was continually impressed by the communication throughout the experience that let him know that he mattered and no one was going to lie to him or surprise him. This was HUGE for my son based on his very bad experience with the staph infection.

I’m proud to live in a place with wonderful medical care, with an emphasis on the child patient’s total well-being.

Kristen Brown
COLUMBIA

Children’s Therapy Center makes difference in son’s life

Josiah, our 7-year-old son, has experienced a surge of independence thanks to the Tiger Intensive program at MU Health Care’s Children’s Therapy Center. After his first round of therapy, he immediately went to our steep and hilly backyard and explored all on his own — without any help or support. He had never done that before.

It is amazing to watch his balance, motor skills and language skills continue to improve after each intensive session. He can now lay out his clothes in the morning and dress himself independently.

The entire team at Children’s Therapy Center — Megan Henzel, Jessie Nicolaescu, Kelsey Okruch, Rachel Bahner, Dana Chole and Sallie Fruits, just to name a few — has been wonderful. Josiah gets so excited before each visit because they make it so much fun.

Josiah is a very high-energy kid who wants to be a ninja when he grows up. The Tiger Intensive program has been perfect for him. The amount of progress we see, along with the confidence he now has, prove to be worth all his hard work and the 30-minute drive one way every day.

Amy Tuley
HOLTS SUMMIT
Kassie Campbell was having a bad day recently when she visited a downtown coffee shop. As she hurried toward the exit with her coffee, a teenager stopped and asked if she was “that trauma nurse lady.”

Yes, Campbell said, she was the one who presented a driver safety program at his school.

“I never wore a seatbelt before I went to your class, and I was in a crash after your class,” the teen told her. “They told me if I hadn’t been wearing my seatbelt, I wouldn’t have survived.”

Campbell’s day brightened.

“It was a reminder: People are listening,” she said.

Campbell, RN, BSN, spends half her week as a nurse clinician with MU Health Care’s trauma program, caring for patients who have suffered serious injuries. She spends the other half as MU Health Care’s Injury Prevention Outreach Program coordinator, teaching people across Missouri sensible ways to minimize their risk of serious injury.

In her five years leading the outreach program, Campbell created two safety programs for drivers on both ends of the age spectrum. “Is It Worth It?” warns teens about the dangers of distracted and impaired driving, and the importance of wearing seatbelts. “Keep Your Keys” helps older adults know how to stay fit for driving and how to prepare to retire from driving.

She also leads “Stop the Bleed,” a national program that teaches people how to treat victims of traumatic injuries before medical professionals arrive.

Campbell, a lifelong resident of Centralia, gives about 100 presentations of those three programs per year. She doesn’t just go through the motions, either. Campbell constantly tweaks her approach based on feedback, particularly the blunt comments she hears from students. That makes it all the more gratifying when she hears that her message made a difference in someone’s life.

“Her office does the work of several Level 1 trauma centers,” said Jeffrey Coughenour, MD, the medical director of MU Health Care’s Frank L. Mitchell Jr., MD, Trauma Center. “I couldn’t be more proud to call her a friend and colleague. We are blessed to have her share her passion and energy with us.”
Family medicine doctors can take care of newborns, the elderly and everyone in between.

“We are trained to be the first point of contact for any health problem you might have,” said Sarah Swofford, MD, a family medicine doctor at University of Missouri Health Care. “After graduating from medical school, we receive three years of additional training in a wide variety of areas. As a result, we can handle almost anything that walks into our office. But we also know our limits. If we need to refer you to a surgeon or specialist, we will happily help you pick the right person.”

Family medicine doctors offer a streamlined approach to health care. You can discuss and manage multiple ailments during one appointment instead of scheduling appointments with multiple providers.

These versatile doctors can provide the following services:

**PREVENTATIVE CARE:** During these preventative care visits, family medicine doctors can help you kick bad habits.

“We love to partner with our patients to help them live healthier lives,” Swofford said. “Many people tell us they want to eat better, lose weight, exercise more and quit smoking. We are trained to facilitate this behavior change. We can help patients create a plan that leads to long-term success.”

**CHRONIC DISEASE MANAGEMENT:** If you are managing one or more chronic conditions — such as high blood pressure, heart disease, asthma or diabetes — a family medicine provider can seamlessly coordinate your care.

“Even if you are dealing with multiple health problems, we encourage you to visit us for routine checkups and follow-ups so that specialists can have openings in their schedule for patients who need immediate attention,” Swofford said. “Since we are trained to care for the entire body, we treat each visit as an opportunity to work on whichever area needs the most attention at that time.”

**OBSTETRICS AND GYNECOLOGY:** Family medicine doctors can provide routine gynecologic care, including annual well-woman exams and Pap smears. They can also provide prenatal care to women who plan to deliver vaginally.

“There are many advantages to receiving prenatal care from a family medicine doctor,” Swofford said. “We have firsthand knowledge of your health history, we follow you through your pregnancy, we deliver your baby, and then we can care for your baby after he or she is born.”

**DERMATOLOGY:** Family medicine doctors know how to examine your skin in search of acne, rashes or moles that require medical attention.

“We are trained to provide routine dermatologic care,” Swofford said. “If we find something alarming during a skin check, we can perform simple in-office procedures such as biopsies or mole removals, and we know when to refer you to a dermatologist if need be.”

**MENTAL HEALTH:** If you are experiencing mental health issues, a family medicine doctor can make a proper diagnosis and provide the right medications and treatment options.

“We often help patients manage common mental health conditions like anxiety and depression,” Swofford said. “But if someone has a more severe mental health issue — such as schizophrenia, psychosis or treatment-resistant depression — we recommend seeing a psychiatrist.”
Andrea Greer, right, was diagnosed with breast cancer in 2013. She was treated at MU Health Care’s Ellis Fischel Cancer Center and participated in a clinical trial. Six years later, she is cancer-free and enjoying time with her daughter, Emily, and the rest of her family.
Family Time Means More Than Ever for Breast Cancer Survivor

Andrea Greer is a devoted mom to her two children, Jackson and Emily. When her kids were younger, Greer, 46, and her husband enjoyed traveling with them as they played ice hockey competitively. They even started a family tradition of attending the Frozen Four, men’s college ice hockey’s national championships.

Appreciating the time with her family took on a new meaning in the fall of 2013. After turning 40, she had scheduled her first mammogram, following doctors’ age recommendations. But about a month before her appointment, she felt a lump in her left breast one evening as she was getting ready for bed.

“It was like a rock underneath my skin that wasn’t supposed to be there,” Greer said. “I called my doctor the next day and got in to have it checked out.”

Within a few hours, she had a mammogram and an ultrasound. The radiologist then requested a biopsy. Greer went home to her family to await the biopsy results. She learned later that week that she had stage 2 invasive ductal carcinoma, the most common form of breast cancer.

“I was very surprised,” Greer said. “It really wasn’t something that I had at all in my brain. I wasn’t in a big hurry to have a mammogram because I just turned 40 and cancer wasn’t something that I was concerned with.”

Doctors at MU Health Care’s Ellis Fischel Cancer Center scheduled her surgery for the Monday before Thanksgiving. Greer, after consultation with doctors and family, chose to have a lumpectomy, a procedure that removes the cancer and saves the remaining breast tissue. She was back to work the week after surgery, but her journey was not over.

Because Greer’s surgery confirmed cancer was present in at least one lymph node, she was eligible for a clinical trial at Ellis Fischel. When her doctor asked her to participate, Greer didn’t hesitate.

“I was lucky enough to be selected as part of a clinical trial, which allowed me to have a little bit different treatment,” Greer said. “I was on board to try anything to help me beat the cancer and that would hopefully ensure it wouldn’t come back.

“It was also kind of exciting in a way to know that what they’re finding out from patients like me could help other women in the future.”

The clinical trial randomly assigned patients to two treatment protocols. One protocol was the standard treatment, while the second was the standard treatment plus a targeted therapy drug called Herceptin. The drug works by attaching itself to receptors on the surface of breast cancer cells and blocking them from receiving growth signals.

Greer was chosen to receive Herceptin for one year in addition to two extra cycles of the traditional chemotherapy. Greer also underwent six weeks of radiation in the summer of 2014 as part of standard treatment. By 2015, Greer was considered in remission.

“It was a mix of emotions when I learned I was cancer-free,” Greer said. “I was excited and relieved at the same time. I just felt so blessed.”

Clinical trials are vital to the evolution of medicine. Each trial helps physician-researchers develop new treatment options for patients.

Puja Nistala, MD, medical director of clinical trials at Ellis Fischel and Greer’s oncologist, said clinical trials give patients access to leading-edge therapies. Ellis Fischel has 30 active trials.

“It’s very meaningful to work with these patients, as it’s a major contribution to medical science and to our community. Without heroes like Andrea, we wouldn’t be able to advance clinical therapies for diseases.”

— PUJA NISTALA, MD

Clinical trial study coordinators are assigned to every patient identified as a possible participant. Oncology nurse Angela Waller, RN, ONC, was Greer’s coordinator and helped her through the process, from enrollment and managing side effects to offering support throughout her treatment. Study coordinators follow their patients for life.

“I consider Angela to be a true friend,” Greer said. “She was another resource that I had to explain treatment and procedures. I got more information and extra attention than I think I would have otherwise.”

Greer overcame her cancer with the support of her family and the team at Ellis Fischel. With her son in college and her daughter in her senior year of high school, Greer places special importance on their annual traditions and trips. They plan to go to Detroit in April for the next Frozen Four.

“I owe everything to the staff and doctors at Ellis Fischel,” Greer said. “Now, it’s more about just enjoying the time — being with family and friends, doing what we love, traveling together and creating memories.”
“I ask patients all the time what’s good about being here? Far and away, the most common answer is Link.”

— CORINNE JOPLIN
Link Specializes in Making Connections

Children’s Hospital’s facility dog is a hit with patients

As an MU Health Care Child Life specialist, Corinne Joplin spends her days trying to comfort young patients. She is only human, though, and sometimes she needs a little help.

“Some patients are tough eggs to crack. We try to talk with them, but they don’t give you much,” Joplin said. “There was a teenage boy who was really sick. He had been intubated, and when he woke up and had the breathing tube removed, he couldn’t do any of the things he wanted to do. This kid hadn’t really said much. So we told him about Link.”

Link is a 2-year-old golden retriever. He became the official facility dog of MU Health Care’s Children’s Hospital in November 2018. After spending a few months getting used to his new home, Link began visiting patients, including that “tough egg” teenage boy.

“We brought Link in and put him on the bed,” Joplin said. “The boy just started silently crying. He was finally able to let his guard down and process some of his feelings. The nursing staff was tearing up, too. Every day after that, no matter what time of day, he said, ‘Hey, when are you bringing Link by?’ That’s the connection Link builds with patients.”

Link is a graduate of the St. Louis-based Duo Dogs program, a nonprofit organization that trains service dogs. Last fall, Joplin and fellow MU Health Care Child Life specialists Merideth Lehman and Katie Ellis spent a week in St. Louis receiving their own training on how to handle a facility dog.

Each weekday morning, Joplin brings Link to work. After the staff determines which patients want to see him and would benefit from a visit, Link makes his rounds. He mostly helps children, but he occasionally visits adult patients, too. His handlers use a blanket as a barrier if he gets onto a bed, and everyone must use hand sanitizer before petting him.

One of Link’s biggest fans is 9-year-old Kale West of Boonville, Missouri. It was a rough summer for Kale, who spent four weeks being treated for leukemia at Children’s Hospital. He felt sick a lot and found out he wouldn’t be able to play youth football this year.

“When they offer, ‘Hey, do you want to see Link today?’ it changes his mood,” Gerry West said of his son. “He gets tired of watching TV or playing video games and is in kind of a depression, but when he knows Link is coming, it’s something to look forward to.”

On his final day of inpatient chemotherapy in August, Kale got to pet Link one last time before returning home to his own dog, an Australian shepherd named Sadie. His only regret was he wasn’t able to teach Link to shake.

“I just think it would be a good thing for him to know so he could impress the children,” Kale said. “For someone just meeting Link, for a good impression, Link could do one or two tricks.”

MU Health Care is dedicated to providing patients and staff with the benefits of human-dog interaction, which has been shown to reduce anxiety, pain and blood pressure. The WAGS program includes a team of volunteer owners with certified therapy dogs who visit various MU Health Care facilities. Link is not a part of that program — he’s a full-time employee.

Link helps in three ways: distraction, motivation and comfort. He can distract a patient who is upset about receiving stitches or having blood drawn. He can motivate a child to get out of bed and take a walk. And he can help make an unfamiliar place feel more like home.

“The comment we get a lot is, ‘I am really missing my dogs, and it’s so nice to have one here,’ ” Ellis said. “That’s the cool thing that we can’t provide, but he can. It’s that human-dog connection of comfort, home and familiarity.”

When he’s not busy seeing patients, Link stays in his kennel in the hospital’s Child Life office. Joplin takes him home with her in the evening. When she takes off his blue work vest, he lets his fur down and becomes a regular, rambunctious young pooch who loves to run around in the backyard.

When the vest goes back on in the morning, Link knows it is time to be on his best behavior, with one exception. He occasionally unleashes what Joplin calls “man burps.”

“One time I was in the elevator with two people I didn’t really know, and Link let out a huge, loud burp,” Lehman said. “I had to tell them, ‘That wasn’t me.’ ”

Joplin said patients often ask for Link by name, sometimes before they’ve even met him, as word has spread about the hospital’s most popular new addition.

“I ask patients all the time what’s good about being here?” Joplin said. “Far and away, the most common answer is Link.”

LEFT: Link, the facility dog for Children's Hospital, pays a visit to 9-year-old Kale West of Boonville. Link, a 2-year-old golden retriever, helps distract patients during procedures, motivate them to achieve recovery goals and comfort them during scary times.

BELOW: MU Health Care child life specialists Corinne Joplin, left, and Katie Ellis received training to learn how to get the most out of Link.
In March 2019, a 37-year-old diabetic woman was admitted to MU Health Care’s University Hospital with an open sore on her toe. Two days later, she looked and felt about the same, showing no obvious signs that her body had declared war on itself.

What human eyes couldn’t see, an algorithm noticed.

“All of the clinical signs, in and of themselves, were fairly subtle,” said Megan Cram, RN, the clinical manager of University Hospital’s medical specialties unit. “It was a slight elevation in her respiratory rate, a slight elevation in her temperature, a slight decrease in her blood pressure. But all of those things combined is what makes the National Early Warning Score. That’s what gave us the picture that something bigger was going on.”

The patient was in the early stages of sepsis, a condition caused when the immune system has a flawed response to infection. It creates widespread inflammation and can damage organs.

“Sepsis is an incredibly difficult problem,” said Cathy Jones, MD, a hospitalist who treats patients on the medical specialties unit. “Left untreated, people die of sepsis. In the early stages, when it’s easiest to treat, it’s very hard to recognize.”

One successful tool for early recognition is the National Early Warning Score (NEWS). It’s a system that assigns point values to a patient’s vital signs and compiles a score. The higher the score, the sicker the patient.

The score doesn’t do much good, though, if a patient’s care team isn’t aware of it.

When MU Health Care’s leaders considered ways to attack the sepsis problem with a NEWS alert system, they selected a group of doctors and nurses — including Jones and Cram — and members of the Tiger Institute for Health Innovation. The Tiger Institute is the IT team created 10 years ago as a partnership between Cerner Corporation and the University of Missouri.

Integrating the NEWS alert algorithm into the electronic health record (EHR) fell to the Tiger Institute’s Ben Wax, RN. Four years ago, Wax, who was then an emergency department nurse at Women’s and Children’s Hospital, wrote the original proposal for MU Health Care to incorporate NEWS into the EHR, which is a digital version of a patient’s medical chart.

In his new IT role as a senior clinical informaticist, Wax helped turn his passion project into reality.

Wax quickly got a NEWS algorithm from Cerner and worked with colleague Shon Dunlap to import it into the EHR. It ran in the background, collecting data but not sending out alerts. He spent more than two years collaborating with Jones to analyze the data and customize the coding.

The resulting algorithm is 241 lines of step-by-step instructions that tell the computer how to respond to any information entered into a patient’s chart. It’s a list of if-then statements separated by “ANDs” and “ORs” that alerts the right people at the right time when a patient is deteriorating. And it does so without creating unnecessary extra work for the doctors and nurses caring for the patients.

“I’ve been eating and drinking this algorithm for a little over two years,” Wax said. “It is my baby.”

Wax’s baby went live on the medical specialties unit in March, the same week the diabetic patient with the toe ulcer was admitted to the hospital.
‘They are us’

The history behind Wax’s algorithm and countless other IT innovations dates back to the fall of 2009. That’s when the University of Missouri and Cerner, the Kansas City-based health information technology company, decided to launch a partnership. The goal was to become one of the country’s most technologically advanced hospital systems.

In 2014, just five years into the partnership, MU Health Care became the first academic health system in the nation to meet the federal government’s standard for “meaningful use” of medical information technology. The next year, it won the national Davies Award for Excellence, which is the equivalent of the Heisman Trophy for health IT.

The Tiger Institute has made health care more convenient with the HEALTHConnect app, which allows patients to manage appointments, view their medical records and request prescription renewals from their phones. Now, patients of Lake Regional Health System in Osage Beach can use the app and enjoy the benefits of shared health records with MU Health Care. By next spring, patients of Capital Region Medical Center in Jefferson City will be on the same platform as well.

“It is very rare to visit any institution where the CEO says, ‘One of the foundations of our success is our IT department,’ ” said Tom Selva, MD, MU Health Care’s chief medical information officer and the Tiger Institute’s medical director. “That’s the case here, because they are us. It’s a partnership. Health care is really about ingesting information and making decisions and sharing information. Health IT and health care have become a very blurred line.”

When the Tiger Institute began, its first big job was to connect all of MU Health Care’s hospitals and clinics with an electronic health record. Now, the Tiger Institute finds ways to use the EHR as not just a medical record but also a tool to improve patient care.

The NEWS alert project is just one of many examples of the Tiger Institute using the EHR as a tool to improve patient care. Among the others are an alert that has reduced the number of unnecessary blood transfusions and one that monitors the amount of opioid medication prescribed to patients.

“Our mission is to save and improve lives,” said Bryan Bliven, the chief information officer and executive director of the Tiger Institute. “Our mission is not to just be good at IT.”

‘You Ain’t Seen Nothing Yet’

Back in March, Wax’s algorithm triggered an alert to the nurse on duty when the diabetic woman’s NEWS score jumped from 2 to 8, which indicates a patient is at high risk. The nurse summoned the hospital’s rapid response team, whose members came to the bedside and began treating the patient with antibiotics. Less than three hours after the alert, she was transferred up one level to the progressive care unit.

The entire process worked flawlessly.

“She was transferred back to us within four days with sepsis resolved,” Cram said. “We avoided intensive care unit days. We avoided a patient decline, so she wasn’t even placed on a ventilator and didn’t require that additional support. We were able to get her treatment started much earlier than we would have before.”

The patient was released soon after returning to the medical specialties unit. Her success story was not an isolated case.

During the NEWS alert’s pilot testing phase, the mortality rate on the medical specialties unit was 2.5%, compared to 3.4% the previous quarter. Based on the number of patients treated, that translates to eight lives saved in three months.

The NEWS alert is now live throughout University Hospital, and the algorithm is still evolving. Now, when a nurse gets a NEWS alert and opens the patient’s chart, a form that Wax created pops up and guides the nurse through what steps to take and which tests to order.

When Wax thinks about the lives that have been saved, he’s proud. But he’s already thinking ahead to the next quality project: the implementation of a pediatric version of the NEWS alert that will help the care teams at Women’s and Children’s Hospital quickly identify children whose conditions are declining.

“It feels cool. I dig it,” Wax said. “But I’m really looking forward to the pediatric project. If you thought this one was cool, you ain’t seen nothing yet.”
A rural Missouri man falls and injures his back late at night. He is rushed to the emergency room of the nearest community hospital, but there is no spine MRI expert available at that hour to run the scanner. The doctor caring for this patient alerts an imaging technician working the overnight shift at MU Health Care’s University Hospital. Using a “virtual cockpit,” the technician assists the person operating the scanner from 100 miles away. As a result, the doctor can make an informed decision about whether the patient needs to be airlifted to Columbia for advanced care.

That futuristic scenario could soon become reality, thanks to the new Alliance for Precision Health, a partnership between Siemens Healthineers, the University of Missouri System and MU Health Care. Siemens Healthineers is a leading manufacturer of medical technology, such as MRI and CT scanners.

“Siemens Healthineers sells the equipment, but they have come to recognize they are really the experts in how to make the most of the equipment,” said Talissa Altes, MD, the chair of the MU School of Medicine’s Department of Radiology. “Without their input, it can be the equivalent of buying a Ferrari but driving it around like it’s a Yugo. Siemens Healthineers wants to change their paradigm of how they work with radiology departments. This partnership will allow them to come here and share their expertise for helping radiology departments use imaging technology to its greatest capacity.”

The partnership is tied to the University of Missouri’s NextGen Precision Health Institute, the $220 million research facility under construction next door to University Hospital. The institute, which is slated to open in 2021, will be outfitted with the latest equipment from Siemens Healthineers. Access to the best technology and expertise should increase the University of Missouri’s research power and make the UM system a destination for students interested in biomedical careers.

The “virtual cockpit” is slated to go live in the MU Health Care system within a year, and then it could be expanded to other Missouri community hospitals that would like access to round-the-clock imaging. It is just one of several ways the partnership will improve patient care.

Another is the addition of a 7-Tesla scanner — which Altes dubs “the Ferrari of MRIs” — that will be part of the NextGen facility. The 7T offers more than twice the magnetic field strength of a conventional 3T scanner. It is the only 7T scanner cleared for clinical head and knee imaging.

“With the 7T, it’s been shown that we can see structures smaller than we can currently see. We get a level of detail in our images that is greater than what was possible previously,” Altes said. “Some of these structures we couldn’t see before are associated with diseases like different types of dementia and Parkinson’s. By being able to see these things, we’ll initially be able to do research on whether these are early predictors of the disease’s course, and then we’ll be able to use it on our patients to help our physicians manage patients better.”

The University of Missouri and MU Health Care partnered with Siemens Healthineers to create the Alliance for Precision Health. MU will get the latest medical technology equipment, including a powerful 7-Tesla scanner.
Construction is underway on the NextGen Precision Health Institute just east of University Hospital. This facility will harness the brainpower of all four University of Missouri campuses to create medical breakthroughs. The building’s gathering spaces and labs will foster collaboration among the university system’s experts in engineering, medicine, veterinary medicine, animal sciences, and arts and sciences.

“The NextGen Precision Health Initiative will help us translate fundamental research from laboratories to effective treatments and devices, which will benefit all Missourians as well as the rest of the world,” UM President Mun Choi said at a groundbreaking ceremony on June 21. “As the boldest and most innovative investment in our history, this initiative and facility will stand as enduring symbols of our commitment to the state of Missouri.”

LOCATION:
Northwest corner of Hospital Drive and Virginia Avenue

PROJECTED COMPLETION DATE:
October 2021

COST:
$220.8 million

SIZE:
Five stories and 265,000 square feet
Athletic Trainers Give Small Schools Pro Treatment

MU Health Care athletic trainer Rick Sage examines Zane Rice of the Fayette football team before a preseason scrimmage. Sage and colleague Matt Rowlett, who work in the Mizzou Physical Therapy and Sports Medicine clinic in Boonville, serve as athletic trainers for eight area high schools.

Early in his career as a coach at New Franklin High School, Ross Dowell didn’t have access to an athletic trainer for his players, so he did the best he could on his own. Dowell said he had a perfect record diagnosing broken bones with a tuning fork — a trick he learned as an undergraduate student — but he was glad to leave medical care to the professionals when MU Health Care began offering the services of athletic trainers to his school for free.

Matt Rowlett and Rick Sage, certified athletic trainers who work at the Mizzou Physical Therapy and Sports Medicine clinic in Boonville, spend time each week tending to athletes at eight small high schools in the area.

“I was relying on what I learned from two or three classes I had in college 20-some years ago,” said Dowell, who is now the athletic director and head softball coach at New Franklin. “Having a trainer stop by once a week — and Rick sometimes coming by on his way home to look at a kid — my gosh, it’s changed everything for us here. It’s tough for a school this size to be able to pay for an athletic trainer, so this is very valuable.”

Rowlett started working at the Boonville clinic in 2010. He serves the schools in Bunceton, Jamestown, Prairie Home and Tipton. Sage was hired in 2017, and he covers Fayette, Glasgow, New Franklin and Pilot Grove.

“We are very appreciative of MU Health Care allowing us to go out into the communities where we live to help them with their student-athletes’ needs,” Sage said.

When athletes get hurt in practice or games, trainers can diagnose the injury. If it’s something relatively minor, such as a sprain or strain, they can treat the injury on the spot and create a recovery plan. If the injury is more serious, trainers can refer the athlete to a physician. Rowlett and Sage also teach their schools’ staff members to perform first aid and CPR.

“I really enjoy helping kids out,” Rowlett said. “We go out to primarily rural high schools, and these are kids that might not have access to seeing a physician. They can come see us at the high school, and we can look at their injury and help them get through it.”

Rowlett and Sage usually spend two to three hours per week at each school in addition to their work in the clinic. Tipton and Fayette are the only schools of the group that play football, so the trainers spend their fall Friday nights on the sidelines of those games. They both live near their schools — Rowlett in Boonville and Sage in Fayette — and they have developed tight bonds with the coaches, so they rarely say no if an athlete needs attention at odd hours.

“My coaches have called me at 11 at night and said, ‘We’re pulling into town. Would you mind taking a look at so-and-so?’ I’ll do it,” Sage said. “We’re there to help the athletes any way we can.”

Learn more about the MU Health Care sports medicine program’s rehabilitation and performance offerings at muhealth.org/sports-rehab.
Each year, more than 15,000 Americans die from ruptured aortic aneurysms. Most people don’t realize they have an aortic aneurysm — a balloon-like bulge in the heart’s main artery that hinders the heart’s ability to pump blood to the rest of the body — until it breaks open, causing life-threatening internal bleeding.

People living in the Midwest are at a higher risk for developing aortic diseases that can cause aneurysms.

“It’s called the silent killer,” said Jack Bell, of Boonville, Missouri, who was diagnosed with an aortic aneurysm when he attended a free screening offered by MU Health Care. “You could have one right now and not even know it until it ruptures.”

Bell, 79, needed a minimally invasive surgery called a snorkel endovascular stent grafting, or snorkel-EVAR. MU Health Care vascular surgeons Jonathan Bath, MD, and Naveen Balasundaram, MD, performed the complex procedure.

Bath threaded a flexible tube through an artery in Bell’s groin to the aortic aneurysm. He then placed a small tube, called a stent, inside the aorta to reinforce its wall and keep the aneurysm from rupturing. Meanwhile, Balasundaram used a similar technique using arteries in Bell’s arms to place snorkel stents next to the main stent to create pathways for blood to reach branch arteries. They are called snorkel stents because they actually look like snorkels, small J-shaped tubes that allow blood to flow through them.

“Aortic emergencies are some of the most life-threatening emergencies we deal with as vascular surgeons,” Bath said. “Jack Bell was fortunate because we knew he had several aneurysms that we needed to repair. We were able to get him the care he needed before one of his aneurysms ruptured.”

Bell recovered quickly after a two-night hospital stay. “I can do anything I want,” he said. “I have absolutely no restrictions on what I can or can’t do.”

Bath came to the University of Missouri to study aortic disease and treat the largest number of patients possible.

“This is one of the highest-prevalence areas in the country,” Bath said. “Informally, vascular surgeons know there is an aneurysm beltway that runs through the Midwest. It’s the part of the country where aortic disease is most common due to a cluster of risk factors.”

Caucasian men over 50 are at the greatest risk for aortic disease. Other risk factors include obesity, diabetes, smoking and family history.

Bath recommends men be screened around age 65 as part of their routine physical exams. Doctors use a simple and painless ultrasound to screen patients. If the screening shows an aneurysm, doctors will monitor it regularly until it becomes large enough to need closer follow-up with a CT scan and, ultimately, surgical repair.

“One way we can improve aortic disease care is through more screening,” Bath said. “We need to educate people on the risk factors and encourage them to be screened if they are at risk. We need to make sure people understand that this can happen to anybody — your father, your brother, someone you care for.”
By the Numbers in 2019

Missouri’s premier academic health system began when University Hospital opened in Columbia in 1956. Today, MU Health Care includes five hospitals and more than 50 clinics. Here are some highlights from Fiscal Year 2019.

**236,563** TOTAL PATIENTS

**632** BEDS
- **158** INTENSIVE CARE
- **474** ACUTE CARE

**231,343** MISSOURIANS

**5,220** OUT-OF-STATE

**2,551** BIRTHS

**27,847** PATIENT DISCHARGES

**8,168,338** PHARMACY DOSES

**3,049** CARDIAC CATHETERIZATION PROCEDURES

**79,733** Emergency and trauma center visits

**445** PATIENTS TRANSPORTED BY HELICOPTER

**723,783** CLINIC VISITS (all sites)

**328,606** RADIOLOGIC EXAMS AND TREATMENTS

**26,696** MAJOR SURGICAL OPERATIONS

**1,761,948** LABORATORY TESTS

Statistics are reported for Fiscal Year 2019, from July 1, 2018, to June 30, 2019.
To help determine the level of care that’s right for you, visit muhealth.org/levelofcare

Convenient Care Options

VIDEO VISITS
Health care providers are available online 24 hours a day to diagnose common conditions and prescribe medicine as appropriate. Download the app at muhealthvideovisits.org

MIZZOU QUICK CARE
MU Health Care nurse practitioners and physician assistants treat common health issues for patients 2 years and older. There are clinics inside each of Columbia’s three Hy-Vee stores.

MIZZOU URGENT CARE
MU Health Care physicians treat immediate but non-life-threatening issues, with imaging and lab services available. Its new location is 3916 S. Providence Road in Columbia.

EMERGENCY CARE
For severe conditions, seek care at the emergency rooms of University Hospital and Women’s and Children’s Hospital.

On June 1, 2019, a bigger version of MU Health Care’s Mizzou Urgent Care clinic opened in a new location at 3916 S. Providence Road in Columbia. The clinic has grown from six rooms to 12, with four rooms dedicated to pediatrics. Mizzou Urgent Care offers walk-in services for non-life-threatening conditions and is open from 8 a.m. to 8 p.m. seven days a week.
When Maddie Gehrke emerged from anesthesia after arthroscopic surgery on her right hip, she felt good — surprisingly good. “I was surprised to not be in pain,” she said of the January 2019 surgery. “I was like, ‘Did I even have my surgery? What’s going on?’ ”

Gehrke came to MU Health Care’s Missouri Orthopaedic Institute to find a solution to her right hip pain. After enduring some complications when her left hip was repaired in 2018, Gehrke wasn’t sure what to expect when surgeon Nathan Skelley, MD, suggested she try a new approach.

Thanks to the new procedure, which involves an innovative surgical table, MOI patients such as Gehrke can now avoid the painful complications that often accompany traditional arthroscopic hip surgeries. “It’s a night-and-day difference,” she said. Gehrke came to MU in 2015 on a swimming scholarship. She quickly established herself as a standout in the pool. She earned All-American honors three times as a member of relay teams that placed at the NCAA Championships. Then hip pain sidelined her.

Gehrke, 22, suffered from femoroacetabular impingement (FAI) or hip impingement. It’s a condition in which the head of the thigh bone fits irregularly in the hip socket and causes friction. FAI is a common cause of hip pain in young people and can lead to early osteoarthritis if the rubbing damages the cartilage in the joint. FAI symptoms include groin pain while walking or flexing the hip and decreased range of motion. As the condition progresses, it can be painful even to sit for long periods.

“FAI is a chronic pain, so it’s always present,” Gehrke said. “When it got so bad that I couldn’t even walk or sleep, I knew that I needed to go the surgical route.”

Because the hip is a ball-and-socket joint, the surgeon needs to create enough space between the femoral head and the hip socket to maneuver the instruments. The medical process for this is called applying traction to distract the hip.

The traditional method of hip distraction requires placing a post between the patient’s legs so the hip stays in one position while the legs are pulled, opening up the space in the hip joint for the surgeon’s instruments. The pressure of the post against the groin can cause soft tissue injuries, nerve damage, urinary dysfunction and sexual dysfunction.

Gehrke had traditional arthroscopic surgery on her left hip in June 2018. The
Outpatient Joint Replacement Offers Shorter Stay

Having a knee or hip replaced once required several days in the hospital to recover. The length of hospital stay for joint replacement surgery has steadily decreased over the past decade.

Now, some patients can have an outpatient joint replacement, either going home on the day of surgery or the next day less than 24 hours after surgery. Over the next decade, outpatient joint replacement could become the norm for as many as half the patients.

“We deliver great joint replacement care to everybody — no matter whether they are healthy and active or if they have had a significant decline in health because of arthritis,” said James Keeney, MD, a surgeon who specializes in knee and hip replacements at MU Health Care’s Missouri Orthopaedic Institute. “If you’re highly active, highly motivated and you want to recover in your home, outpatient joint replacement is not only possible but also a very good way to get back to your normal life.”

Preparing for surgery with focused strength exercises and the use of multiple tools to manage surgical pain have helped reduce time in the hospital after surgery. A short-acting spinal anesthesia or a general anesthetic allows patients to be active sooner after their surgery. And patients having outpatient surgery now start physical therapy in the first two to three hours after surgery. All of these treatment changes have helped to speed up the early recovery process.

MU Health Care offers two options for people who want outpatient joint replacement.

“The traditional approach for an outpatient procedure is for patients to have their surgery early in the day and to be discharged home after a single interaction with physical therapy. When you’re ready to go home, we let you go home,” Keeney said. “For other patients who may be feeling uneasy about going home the same day, we can perform surgery later in the day and have physical therapy work with you later in the day and then again the next morning. You will go home the morning after surgery before reaching the 23-hour limit. That’s the best of both worlds, as I look at it — an outpatient surgery with an overnight stay.”
Take a Deep Breath ... and Lower Your Blood Pressure

Shamita Misra, MD, grew up in India and returns to her home country at least once a year. India is the birthplace of yoga, and when Misra is there, she often hears about the health benefits of the ancient discipline.

“People are always talking about yoga, yoga, yoga,” said Misra, an associate professor in the University of Missouri School of Medicine’s Department of Family and Community Medicine. “Some people say it’s the answer to every possible illness, including cancer. It sparked my interest to do some testing to see if it does anything at all.”

She and colleague Jane McElroy, PhD, decided to test whether doing yoga breathing exercises decreases blood pressure. They recently published the results of a study that revealed most people with uncontrolled high blood pressure who practiced yogic breathing lowered their blood pressure.

“It’s a very complementary intervention in people with uncontrolled hypertension. There is no harm, no side effects and it’s inexpensive. It’s an additional tool people can practice and hopefully have some reduction in blood pressure.”

— SHAMITA MISRA, MD

A typical yoga session includes breathing exercises, meditation and poses. This study focused strictly on breathing. A group of volunteers with uncontrolled high blood pressure were randomly divided into three groups. Two of the groups practiced breathing exercises in 15-minute sessions five times a week — one group attended classes led by Misra, and the other followed an DVD/online instructional video. The third group didn’t participate in the breathing exercises and continued taking their blood pressure medications.

Overall, 54% of people who did the yogic breathing exercises — it didn’t matter whether it was in class or online — lowered their blood pressure by at least five points.

The study shows that for people who struggle to keep their blood pressure at safe levels, even with the help of medications, practicing yoga can be an effective strategy to lower their risk of dangerous complications such as heart attacks or strokes.

“I think the message is: Take charge of your health,” said McElroy, an associate professor of family and community medicine at MU. “There are things you as a patient can do to enhance your healthy life trajectory. It doesn’t have to be completely dependent on medication the doctor gives you. This is one piece.”

Participants in the yogic breathing study performed five exercises:

1. **BELLOWS BREATHING**: Take deep breaths that fill lungs to the collar bones, followed by deep exhales.

2. **RAPID EXHALATIONS**: In quick bursts, expel air through the nose 10-15 times after each inhalation.

3. **ALTERNATE NOSTRIL BREATHING**: Close right nostril and breathe in through left, then close left nostril and breathe out through right.

4. **BUMBLEBEE BREATHING**: Plug ears and breathe in and out through nose while humming like a bee.

5. **OM SINGING**: Breathe in normally and say “om” while exhaling.

To try yogic breathing, watch Dr. Misra’s instructions at medicine.missouri.edu/yoga.
That is the phrase Gwen Nolan and her graduate students say over and over during the weekly Parkinson Speech Program group therapy sessions they lead at Lewis Hall on the University of Missouri campus.

“When most people think of Parkinson’s disease, they think of tremor, but PD also impacts the muscles that control voice, swallowing, breathing and articulation,” said Nolan, a professor in the MU School of Health Professions’ Department of Speech, Language and Hearing Sciences.

People with Parkinson’s often speak in quick rushes, with their voices trailing off at the end of a sentence. That can make them hard to understand.

Kathy Rinehart-Hansen suffers from muscle-tension dysphonia — voice hoarseness — after straining her voice as a coach for 41 years, and her Parkinson’s contributes to her voice problems. Rinehart-Hansen said she sounds better after participating in the Parkinson Speech Program.

“I used to have a rough, gruff-sounding voice, but now I slow down and I don’t have the sound of the glottal fry,” she said.

Nolan uses evidence-based treatment programs called SPEAK OUT!® and The LOUD Crowd® developed by the Parkinson Voice Project, a nonprofit organization that provided grant funding and materials to help make this MU program possible. Participants start with individual SPEAK OUT!® sessions twice a week for six weeks. They then graduate to The LOUD Crowd®, a weekly group maintenance program.

Nolan said having the patients focus on speaking with intent helps them calibrate their voices to be more understandable.

“Intent is the focus across every activity from warm-ups through cognitive tasks,” Nolan said. “When patients speak with intent, not only can you hear them, they can be understood, because their articulation is clearer and their voices sound stronger in addition to sounding louder.”

Rinehart-Hansen said the classes have made an impact in her life.

“The group therapy has been real helpful,” she said. “Even outside therapy, like at the gym or at support group, my fellow Parkinson’s friends and I are always telling each other, ‘Speak with intent!’ ”
The Doctor Is In
MU Health Care welcomes its new providers. For help selecting the right physician for you, use our Find A Doctor tool at muhealth.org/doctors.

**CHILD HEALTH**

- **Katie Harmoney, MD**
  Hematology, Oncology

- **Anjali Anders, MD**
  Neonatology

- **Zuhal Kadhim, MD**
  Family Medicine

- **Kaci Larsen, MD**
  Family Medicine

- **Joshua Smothers, MD**
  Family Medicine

**MEDICINE**

- **Mauricio Sendra-Ferrer, MD**
  Cardiology

- **Ebbevir Daglllar, MD**
  Gastroenterology

- **Kanak Das, MD**
  Gastroenterology

- **Neal Sharma, MD**
  Gastroenterology, Hepatology

- **Daniel Grace, MD**
  General Internal Medicine

- **Kathryn Mohr, MD**
  General Internal Medicine

- **Christos Papageorgiou, MD**
  Hematology, Oncology

- **Amruth Palla, MD**
  Hematology, Oncology

- **Zachary Holliday, MD**
  Pulmonary, Critical Care, Environmental Medicine

- **Aaron Miller, MD**
  Pulmonary, Critical Care, Environmental Medicine

**OB/GYN**

- **Shyam Shankar, MD**
  Pulmonary, Critical Care, Environmental Medicine

- **Denicia Dwarica, MD**
  Urogynecology

- **Patrick Tassone, MD**
  Head and Neck Cancer

- **Nobert Richardson, MD**
  Bariatric Surgery

- **Amanda Fischer, MD**
  General Surgery
MU Health Care photographer Justin Kelley shares his favorite shots of the summer.

ABOVE: MU Health Care donated $495,000 to help create a permanent home for the Columbia Farmers Market, which provides healthful, locally grown food to mid-Missourians. The market, located at the new Columbia Agriculture Park on 1769 West Ash St., opened on July 6, 2019. The market is open year-round on Saturday mornings. Visit columbiafarmersmarket.org for more details.

LEFT: MU Health Care Air Medical Service has partnered with the Air Evac Life Team to create an expanded program to better serve patients in rural areas of Missouri. There are now helicopter bases in Columbia, Osage Beach, Moberly and Sedalia that help deliver leading-edge care in the field to save and improve lives.
At Ellis Fischel Cancer Center, we have specialized teams for each type of cancer so that when bloodwork like Lindsey’s shows signs of a rare and aggressive form of leukemia, we’re able to create and start a full treatment plan in less than 24 hours. With cancers like hers, time can mean all the difference. And with specialists like ours, pursuing the latest research and knowing exactly what to do at a moment’s notice can too.

Ellis Fischel Cancer Center
MovingCancerCareForward.com