MUSC CATALYST news

WELCOME MUSC HEALTH MIDLANDS DIVISION!

AUGUST 6, 2021 MEDICAL UNIVERSITY OF SOUTH CAROLINA VOL. 37, NO. 17

MUSC Midlands expansion links more sites to state's No. 1 hospital

Photo by Kathryn Van Aernum

Employees sport new T-shirts at MUSC Health Columbia Medical Center Northeast during the official celebration on Aug. 2.

By Helen Adams

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Joanne Carelli is thrilled that the downtown Columbia hospital where she's worked for 43 years is now part of MUSC Health's new Midlands Division. She's pleased not only as a veteran nurse manager but also as woman battling cancer.

"I just feel like research and new data that comes out, the new medications that come out, we're going to know about it. We're going to be part of it because MUSC is so much into research and teaching and education and moving forward," Carelli said.

The leaders of MUSC and MUSC Health, the clinical side of the academic medical center based in Charleston, visited

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> *"It's been such a long time that we were part of something that's local and so well respected."*
>
> **Joanne Carelli, R.N.**

Olympian Simone Biles can be mental health role model, psychiatrist says

By Helen Adams

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While some critics have gone after Simone Biles for her decision to step back from competing in the Olympics, mental health experts are applauding her courage – and hoping her example will help regular people dealing with their own stress.

"I greatly respect what she did for herself, most important, but also for her teammates. There was a lot at stake. She could have pushed through, but she stepped aside and did the difficult thing. It took a lot of courage to know her limits," said Chris Pelic, M.D. He's a professor in the Department of Psychiatry and Behavioral Sciences at MUSC.

"If she continued to compete, it could have been to the detriment of her health. She also wanted to give her teammates the best chance to win, knowing she was not at her best."

Along the way, Biles has given regular people a role model when it comes to mental health, Pelic said. "She's in a position where a lot of people know her and respect her. She can impact other people who might need help but aren't in as visible a situation – maybe they're struggling at work or in school and now are willing to seek care."

Biles, 24, cited stress as her reason for withdrawing from competitions last week. It's not hard to see why she'd feel that way. The 2021 Olympics have been called "The Simone Biles Show." And she's called herself the "Greatest of All Time," or G.O.A.T. That's a lot of weight for anyone's shoulders – even if she put some of it there herself.

And until now, to many, Biles seemed almost superhuman – able to handle whatever was thrown at her. But behind the scenes, she dealt with a lot, including sexual abuse at the hands of former team doctor Larry Nassar. There were also the expectations of her team and her country, all in the context of competing at the Olympics during a global pandemic.

"Each time someone succeeds at a high level, the expectations grow. Often elite athletes are seen as superhuman, almost like machines, whose sole purpose is to compete in sports," Pelic said.

They're not. They're humans – amazing humans – but people, nonetheless. Pelic said it's important to recognize that. And Biles has plenty of company when it comes to stress. A 2020 Gallup poll found that 60% of American adults were dealing with daily stress and worry.

Many people suffer in silence, which can make things worse, Pelic said – especially for an athlete on the world stage. Talking about mental health can be tough. "It's really hard to share, but Simone felt comfortable doing that."

In Biles' case, the urgency of the situation forced her to act. That's true for some of Pelic's patients, too. "In some cases, people may be suffering from anxiety and need to make some split decisions on course of action. Sometimes, treatment can allow the person to stay engaged in normal life or work activities. In other cases, the only good solution is to call timeout and properly attend to the issues at hand. This fight-or-flight state could last 30 minutes or be more prolonged."

Pelic went into more detail about what happens in the body in times of intense stress. "You already may be sensitized to a high-stakes situation, and your body starts releasing cortisol and other stress hormones. Sometimes the process snowballs and becomes unmanageable," he said.

"Some people are already at a higher state of anxiety at baseline, and then they get put in a stressful situation, and it takes their anxiety to uncomfortable levels. Once your anxiety gets so high, performance drops off. It is almost like a computer that has too many windows open – it's on, and everything's spinning, and it looks like things are happening, but nothing productive is happening. They lock up or they leave the situation – or both," Pelic said.

"If you're already connected with a clinician or a provider, you can have a talk about how you might want to proceed with your work or your family and whether you need accommodations or need to take time off to get the help you need. But I think the

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Image Provided

Simone Biles, in a post on Instagram after bowing out of competing in floor exercises.

MUSC Catalyst news

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Editor's note: The MUSC Catalyst News is back on campus. The Office of Public Affairs and Media Relations staff has consulted with MUSC Infectious Disease and Safety and Quality experts and industry studies to confirm that paper products such as newsprint are safe and low-risk in surface–based transmission of the coronavirus.

Copies of the newspaper will be distributed bimonthly to racks around campus, as well as via the MUSC Mailroom's zoned mailbox system on campus and at various MUSC satellite medical offices and clinics in the Tri–county, and will begin distribution in MUSC's regional hospitals, Upstate.

For information about delivery or advertising in The Catalyst News, contact Cindy Abole, print editor, at catalyst@musc.edu or 792-4107. Remember to recycle!

‘I just didn’t think it would go this high this quick’

By Helen Adams
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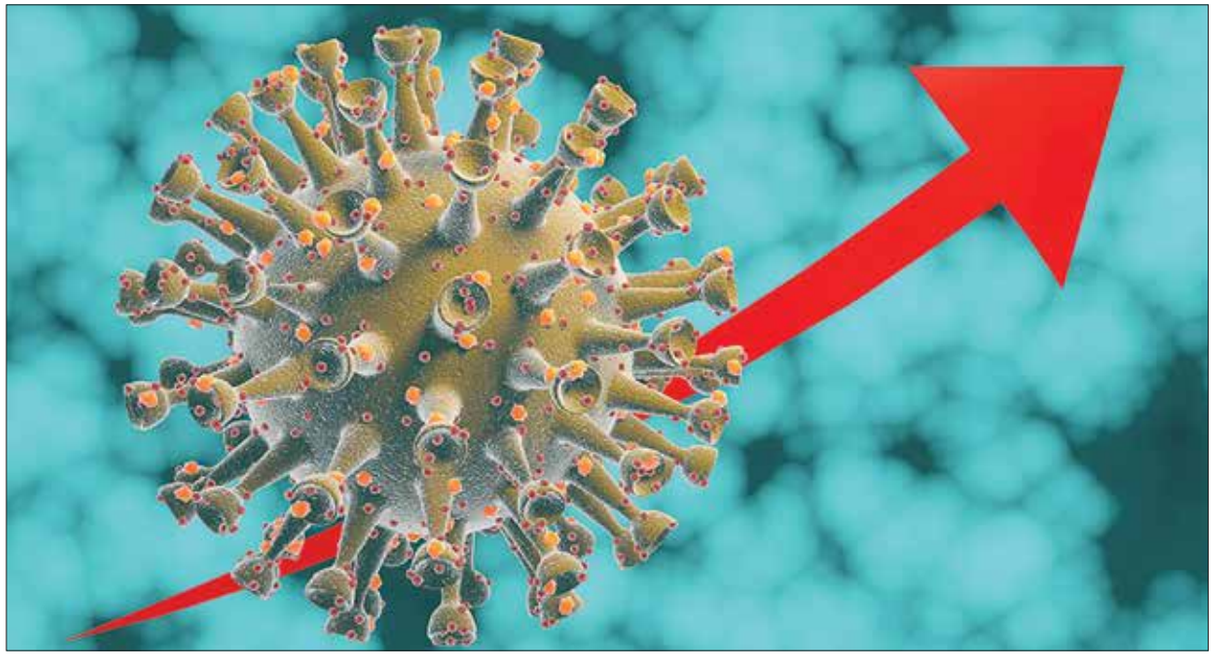

Image Provided

The latest update from the MUSC COVID tracking team shows the number of cases in the Tri–county area doubled in a week.

“It’s kind of back to the old days,” said the leader of MUSC’s COVID tracking team, as a weekly update showed a 90% increase in new infections in the Tri–county area compared with last week. “It’s worrying on so many levels.”

The number of cases in Berkeley, Charleston and Dorchester counties combined was 1,230 for the week that ended July 27. The week before, it was 651. The week before that, 411.

“I just didn't think it would go this high this quick,” said Michael Sweat, Ph.D. “It's targeting this moderate level of people who haven't been infected, and it's happening very fast. It’s just going bonkers in the unvaccinated, and it’s terrible to see.”

Half the state is unvaccinated, according to the South Carolina Department of Health and Environmental Control’s COVID-19 Vaccination Dashboard. But some of the unvaccinated have natural immunity from getting sick with COVID, depending on how long ago they caught the virus. You can blame the delta variant for the increase in cases, Sweat said. It’s highly contagious. “Human psychology makes you want to think that this comes and then goes away, but what's really happening is it keeps coming and going and coming back again. I think people are very frustrated and exhausted with that pattern.”

That includes people who work in hospitals. “I think for the health system, which is obviously a high concern of MUSC, there's sort of three questions in mind for me. How high will this go? How fast will it happen? And how severe are the cases going to be?” Sweat said.

“If you’ve got a lot of people infected, it puts pressure on the health system, but how fast is really important too. If it all happens too quickly, it can overwhelm the system. And I think that's what we're seeing in Louisiana, Missouri and Arkansas and now parts of Florida, where it just happened so quickly that some percentage of people are going to end up in the hospital.”

The delta variant doesn’t seem to make people sicker than earlier iterations of the coronavirus. But its ability to spread easily makes it a real threat.

And there’s now concern that delta may infect a small number of fully vaccinated people who might go on to spread the virus. That’s behind the Centers for Disease Control and Prevention’s latest recommendation that people mask indoors in public places. But Sweat said breakthrough infections are occurring infrequently and are almost all mild cases.

He hopes the overall increase in cases will nudge more people to get their shots. “The areas that are more vaccinated, like up in New England, they're not having the same phenomenon we are.”

He said if our cases continue to go up, we could see something similar to what we’ve seen during earlier waves of COVID: a three-month cycle. “If we peak into September, you would kind of expect it to be down by October. But this could cause a lot of heartburn for issues related to kids in school. We have vaccines that work — it's all a matter of getting people to take them.”

What a COVID expert advising schools wants families to know

By Helen Adams
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Each COVID case in a school could affect many more children and teachers this fall than last year, thanks to the highly transmissible delta variant and opposition to mask wearing. That's according to a pediatric infectious disease expert at MUSC Children's Health who's working with schools to help them reopen as safely as possible amid a surge in COVID cases.

"As we near a new school year, COVID cases appear to be trending higher again due to the impact of new variants, and there is uncertainty as to whether schools will be able to deal with COVID cases as effectively as last year. I am concerned about what will happen this year, because we'll have more kids in each classroom combined with fewer effective ways to minimize close contact exposure and decrease transmission," said Allison Eckard, M.D.

"Severe illness from COVID-19 is rare in healthy children, but the virus is highly infectious. More children will be sent home to quarantine. And if schools follow the same guidance they used last year – which was if there were three kids with COVID-19 in a classroom, they shut down the classroom – that's going to be happening a lot more this year. The less that people do to protect themselves and others, the more likely we're going to have classroom and school closures."

What can families and schools do to protect kids and the people around them as we face the prospect of a third school year affected by COVID-19? Plenty, Eckard said.

First, consider following the American Academy of Pediatrics' recommendation of universal masking in schools.

While public schools cannot require masks in South Carolina, parents can choose for their children to wear one.

"There is an abundance of evidence that masks are safe in children and highly effective in containing large respiratory droplets, the primary way that COVID-19 is spread. They're really your No. 1 strategy for preventing transmission. And frankly, my advice is to encourage your child to wear one at school," Eckard said.

"There are a couple of reasons. One, a lot of school-age students in South Carolina are unvaccinated, which increases a person's chance of being exposed to the virus. With some of the new variants of the virus, we are also starting to see breakthrough cases in people who are vaccinated as COVID-19 cases in the community increase. That may be particularly relevant to the schools, where the risk of coming into contact with someone who is infectious is high and yet some of the primary mitigation tools, such as wearing masks and other classroom precautions, are restricted."

Two, wearing a mask keeps other people from feeling uncomfortable about wearing one. "We don't want to shame people for wearing masks, regardless of their reasons for wearing one." Eckard said. "The more people that you have wearing a mask during the pandemic, the safer the school is going to be."

Second, double down on cohorting, also known as podding.

That means keeping kids together in groups, limiting their contact with students and staff outside their group.

"Cohorting becomes incredibly important, because that way, if there's a positive case in a pod or cohort, they can isolate and quarantine those individuals versus having to shut down a whole grade or a whole school," Eckard said.

But cohorting may become a little tricker this year. Some of the sheets of plexiglass used last year to separate kids have already been removed because they were in such bad shape.

"Before the state government banned mask requirements in schools, we suggested Charleston County schools take down the plexiglass if they could not be replaced periodically with new panels. The chemicals that were needed to clean the plastic were causing the plexiglass to become cloudy," Eckard said.

Photo by Sarah Pack

Back-to-school supplies will include masks for some kids due to an uptick in cases.

> *"There is an abundance of evidence that masks are safe in children and highly effective in containing large respiratory droplets, the primary way that COVID-19 is spread. They're really your No. 1 strategy for preventing transmission. And frankly, my advice is to encourage your child to wear one at school."*
>
> **Allison Eckard, M.D.**

"They started with some of the high schools where vaccination rates were a little bit higher and they had a little more space to separate people, and they were working their way down in grades. But one often overlooked consequence of eliminating a mask requirement and removing the plexiglass is that now, everyone within six feet of a person who tests positive for COVID-19 will automatically be sent home to quarantine for at least 10 days."

Another challenge with cohorting: Most kids will be back in school in person, not learning virtually. That's a good thing, Eckard said – kids need to be in school. But it may make ensuring there's plenty of space between them to try to prevent COVID transmission more difficult.

Third, when younger kids are eligible to get vaccinated, Eckard recommends that families consider doing so.

"Parents should talk to their pediatricians regarding the benefits and risks of getting a COVID-19 vaccine," she said.

But kids under 12 may not get access to the vaccine until early-to-midwinter, a Food and Drug Administration official recently said. Clinical trials are underway, including at MUSC Children's Health, that will help determine the shots' safety in kids under 12.

MUSC Children's Health worked with Charleston County schools last year to offer vaccines to students 12 and up. Eckard said they plans to do the same thing when younger kids are eligible. They'll have to get their parents' permission to get a shot. It's all part

See **Schools** *on page 16*

Meet Linda

Linda Payne, R.N.

Department and how long at MUSC
MUSC Health Kershaw Medical Center; 33 years

How are you changing what's possible at MUSC
By working with our team to create a smooth transition for all staff and patients

Family and Pets
Husband, Todd; son, Michael, 30; and daughter, Courtney, 25

Favorite Olympic sport to watch
Gymnastics

Favorite summer memory
Swimming in Gatun Lake and watching the giant ships move through the locks of the Panama Canal. We were stationed at Fort Gulick.

Something you've done at work that you're proud of
Managing the monoclonal antibody infusion clinic during the height of the pandemic with Rachael Collier. We were among one of the first hospitals in S.C. to offer this treatment infusing almost 500 patients in a 4-bed unit.

MUSC researchers announce gene mutation discovery associated with EDS

By Leslie Cantu

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When Miss America 2020, Camille Schrier, walked into the Norris Lab on the campus of MUSC, she was among peers.

Not other contestants but other people who love science and are affected by an uncommon connective tissue disorder called Ehlers–Danlos syndrome, or EDS.

Schrier is perhaps not a typical Miss America. Her winning talent was a chemistry experiment, and she's pursuing a Doctor of Pharmacy degree at Virginia Commonwealth University.

But it was the Norris lab's focus on EDS that brought her to Charleston.

EDS is thought to affect 1 in 1,000 people. The syndrome is divided into 13 subtypes, which can cause hypermobile joints, a tendency for joints to dislocate, easy bruising, internal bleeding, heart valve problems and more. Because connective tissue is found throughout the body, the disorder can cause problems anywhere in the body.

"It's much more than a structural disease. It's a full-body disorder," said Roman Fenner, a Davidson College student interning in the lab for the summer.

Mutations in some 20 genes have been found to be responsible for some of the subtypes. But the gene associated with the most common subtype, hypermobile Ehlers-Danlos syndrome, or hEDS, has remained – officially – unknown.

But it is not unknown to the researchers gathered in the Norris lab.

Russell "Chip" Norris, Ph.D., a professor in the Department of Regenerative Medicine and Cell Biology, and his team believe they have identified a gene mutation associated with hEDS. They're currently running tests with a model to confirm their findings, which they expect to write up within six months – hopefully sooner.

They're well aware of how eagerly the hEDS community is awaiting their findings: Lead researcher Cortney Gensemer and the four undergraduate summer interns are all EDS patients themselves.

"I think one of the coolest things is, when we publish, we're going to have five people with the disease as authors on the paper. And it's going to be a groundbreaking paper in terms of EDS research," said Gensemer, a fourth-year doctoral student.

As much as the discovery is a huge breakthrough, it is still only the beginning of more research, the team explained. Even so, people with EDS want that validation that there is a physical cause behind their constellation of symptoms, which patients often deal with individually for years before someone finally realizes the seemingly unrelated ailments all point to EDS.

"Everyone who has EDS is so hyper-focused on this gene because it's tangible evidence of what we have. Because in many cases this can be an 'invisible' illness, and you have a lot of doctors saying, 'It's in your head, theoretically you shouldn't be in a lot of pain.' So at least for me, I'm looking forward to having that proof," said Sofia Luzbetak, a summer intern from the University of California San Diego.

Schrier agreed. Because EDS generally isn't life-threatening – at least not with the same immediacy as cancer or other diseases – it doesn't get as much attention, she said. "I'm so thrilled to see a lab focus on it and put the time and effort and money toward it," she said.

Before doing a social media Q&A with Gensemer and Norris, Schrier toured the lab and even got to put her lab skills to use, helping to prepare samples for gene sequencing.

"It's been incredible, as someone who not only loves science and scientific research but is a patient affected by EDS, to be able to watch what I learned as a science student and as an undergraduate researcher be applied to solve a problem for a disease I have," she said of what she'd seen.

Birth of a research project

EDS is not something that Norris is known for. He's spent most of his career investigating the genetics of cardiovascular diseases, including something called mitral valve prolapse, in which the mitral valve flaps don't close properly with each heartbeat. But three years ago, he offered a blanket invitation during orientation for any of the new doctoral students to come see him for advice. Gensemer took him up on the offer.

Gensemer hadn't started her graduate program with the idea of studying EDS.

"Studying my own disease wasn't something I thought was feasible. There was no one studying it, so that was not something I went to grad school thinking I would do," she said.

In fact, when she walked into Norris' office for the first time, she didn't know what she wanted to do.

"I just walked into his office and said, 'Hey,

See **Research** *on page 11*

Photos by Sarah Pack

Camille Schrier, Miss America 2020, works with a sample under the supervision of lead researcher Cortney Gensemer. Schrier, who has EDS, came to tour the lab and learn about the gene mutation discovery the Norris team has made.

Members of the hEDS research team relax along with Miss South Carolina Julia Herrin and Miss South Carolina Teen Dabria Aguilar. The four undergraduate interns are living in the house near the peninsular MUSC campus for the summer.

Charleston, MUSC participate in heat stress study

By Cindy Abole
aboleca@musc.edu

Photo by Sarah Pack

Jordan Clark, a University of North Carolina geography doctoral student, sets up a Kestrel Wet Bulb globe temperature meter to measure the sun's heat as part of a national heat watch program.

As they say in the South: It's not the heat – it's the humidity.

This describes Charleston's muggy summers, especially during July and August when outside temperatures easily climb past the 90 degrees mark. Climate change driven by human-induced emissions of greenhouse gases can result in various changes, including sea-level rise, weather hazards and heat-related health risks to populations.

So, it's no surprise that recent national and global weather events, such as extreme heat waves, hurricanes, droughts, wild fires and flash floods, are linked to climate change and global warming.

In recent years, climatologists and scientists have shown a growing interest in studying rising temperature changes and their causes, around coastal South Carolina, the Southeast and nationally. According to the National Oceanic and Atmospheric Administration (NOAA), 2019 was the second warmest year on record and the end of the warmest decade (2010 to 2019) ever recorded. Extreme heat kills more Americans than any other weather event, but not everyone's risk is the same.

"Every year, communities are noticing hotter temperatures that they've never seen before, and it's happening in more places than usual," said Charles "Chip" Konrad, Ph.D., director of the NOAA Regional Climate Center and professor of Geography at the University of North Carolina at Chapel Hill. "Temperatures are increasing and with potentially dire consequences to people, cities and the environment."

On July 14, Konrad joined a cadre of collaborative experts as part of MUSC's monthly Conversation Cafe series, addressing the topic of "Meteorology Behind Heat Stress." The hour-long virtual presentation, hosted by MUSC Sustainability and Recycling, explored the latest heat research and the science behind it, how heat connects to health and an update on local projects addressing heat-related problems in Charleston in addition to other urban communities around the country.

Konrad, who is the principal investigator of the Carolinas Integrated Sciences and Assessments (CISA) team, arrived earlier that week to test customized equipment that measures heat stress, specifically Wet Bulb globe temperature (WBGT), around peninsular Charleston and surrounding locations. WBGT accounts for temperature, humidity, wind speed, sun angle and cloud cover (solar radiation) in direct sunlight. The heat index measures temperature and humidity in shady areas. Konrad and his team will use WBGT thermometers mounted to tripods. A separate research project will mount heat sensors on cars as they record temperature and humidity in various areas as part of NOAA's HeatWatch Program, an urban heat island mapping campaign, which will occur July 31 in Charleston and participating cities.

According to Konrad, Charleston offers a unique geography and location to conduct this level of urban heat research. The city's peninsular location –surrounded by a harbor with rivers, wetlands and ocean breezes – makes it ideal to study overall heat stress temperature and model it for future research. Results from Konrad's data gathering research will be matched to satellite data to provide a more accurate picture of the city's hottest locations, especially urban heat islands – areas of a city that are hotter than surrounding areas.

City planners, architects and community partners can use this information to make improvements, create environments and establish plans for future development, and specific groups and audiences can also benefit – from outside workers and people who exercise outside to student athletes who work out in practice fields during the summer. It also serves to make authorities aware of heat hazards so they are able to plan accordingly and protect the well-being of others.

Konrad's team has created a useful WBGT forecast tool to monitor extreme heat. Combining WBGT data with the National Weather Service's hourly forecasts for air temperature, relative humidity, dew point temperature, wind speed and degree of cloud cover and sun azimuth angle – researchers can determine a five-day forecast of WBGT for various Southeastern cities and locations.

In North Carolina, Konrad has successfully worked with coaches and high school athletic directors in public school districts to apply his forecast temperature tools to determine WBGT and other measurements that relate to temperatures at school practice fields. His team also established a color-coded warning system and guidelines to monitor heat throughout the day: green (80 to 84.9 degrees); yellow (85 to 87.9 degrees); red (88 to 89.9 degrees) and black (90 degrees and above. For example, if WBGT instruments measured black (90 degrees or higher), all outdoor sports practice would be suspended.

> *"Awareness of heat has always been a challenge. We need to do a better job communicating this to help audiences understand this and initiate important conversations within families, with coworkers, acquaintances and the public."*
>
> **Charles Konrad, Ph.D.**

The Department of Labor's Occupational Safety and Health Administration (OSHA) has set strict guidelines for employers to monitor the heat index, which protects outdoor workers from serious heat-related hazards and illnesses.

"Awareness of heat has always been a challenge. We need to do a better job communicating this to help audiences understand this and initiate important conversations within families, with coworkers, acquaintances and the public."

"Our tool is geared toward high school athletics, but we'd

See **Heat** *on page 16*

Dr. Pat Cawley, MUSC Health CEO, addresses the crowd at the MUSC Health Fairfield Emergency and Imaging celebration.

Right photo: MUSC Health iced cookies were distributed at the MUSC Health Midlands Division celebrations.
Bottom photo: MUSC President David J. Cole applauds the audience at the Aug. 2 MUSC Health Kershaw Medical Center event.

Sue Shugart, MUSC Health Kershaw Medical Center CEO, attended the Aug. 2 event, announcing MUSC's purchase of the hospital.

MUSC Health's new Midlands Division includes:

- ❑ MUSC Health Columbia Medical Center Downtown
- ❑ MUSC Health Columbia Medical Center Northeast
- ❑ MUSC Health Fairfield Emergency and Imaging
- ❑ MUSC Health Kershaw Medical Center

Midlands

Continued from Page One

Carelli's hospital and three other Midlands sites on Aug. 2 to welcome employees and share their vision for the future.

"MUSC must find ways to have partnership and presence throughout the state to help facilitate the best local care possible and provide better connectivity to the high-quality, highly specialized care we are known for," said David Cole, M.D., president of MUSC. "Statewide presence is the linchpin to delivering on our mission."

That statewide presence has been steadily growing. In 2019, hospitals in the Chester, Florence Lancaster and Marion areas joined MUSC Health. The latest additions involve the purchases of Providence Health and KershawHealth from Tennessee-based LifePoint Health.

Carelli is glad to become part of a South Carolina-based health care group again. "It's been such a long time that we were part of something that's local and so well respected."

MUSC Health's new Midlands Division includes: MUSC Health Columbia Medical Center Downtown; MUSC Health Columbia Medical Center Northeast; MUSC Health Fairfield Emergency and Imaging; and MUSC Health Kershaw Medical Center.

David Stratford works at the hospital in Kershaw, leading the team that keeps instruments sterile for surgeons. "When I first came here in 1975, it was Kershaw County Memorial Hospital. I've been through four or five changes. I think MUSC has the resources to take us to where we need to be," he said. "I think it's going to work out well."

Cole emphasized the value of those resources as he spoke to new employees. "You're now part of the state's only comprehensive academic health system, during one of the most transformative moments in modern health care."

Patrick Cawley, M.D., CEO of MUSC Health and vice president for Health Affairs, University, said that transformation is happening both deliberately and swiftly. "It was just a month ago that we had a definite agreement worked out, and it was because we felt so strongly about bringing you all on board and doing it as quickly as we could because South Carolina can't wait. We need high-quality care and better access to care," he said.

"While we've been doing outreach in the Midlands for years, having this presence in the community takes it to a whole new level. Each one of these facilities already had a great culture. We're going to take their great culture and our great culture and combine them to bring the best care possible to this area."

With the new additions, MUSC now has about 19,000 employees statewide. Carelli is happy to become one of them. "You can just feel the excitement, and you have felt that excitement over the past month. We're going to MUSC. Everybody is just looking forward to it."

Photos by Kathryn Van Aernum, layout by Sarah Pack and Cindy Abole

Dr. Patrick Cawley, MUSC Health CEO, joins Terry Gunn, CEO MUSC Health Midlands Division, at the MUSC Health Columbia Medical Center Downtown event.

Camden Mayor Alfred Mae Drakeford speaks at the MUSC Health Kershaw Medical Center celebration.

"It was just a month ago that we had a definite agreement worked out, and it was because we felt so strongly about bringing you all on board and doing it as quickly as we could because South Carolina can't wait."

Patrick J. Cawley, M.D.

Fast facts about MUSC Health's new Midlands Division

✶ The former Providence Health was founded in 1938.
✶ 338 beds

✶ The former KershawHealth was founded in 1913.
✶ 139 beds

Melody Knapp, assistant vice president, left, and Traci Dennis, clinical nurse manager, are all smiles attending the MUSC Health Columbia Medical Center Downtown event.

Info security officer reflects on 43 years of health care technology changes

By Leslie Cantu

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Richard Gadsden Jr. has spent a lifetime on the MUSC campus — literally. His father, Richard Gadsden Sr., Ph.D., was a biochemist and clinical pathologist with a long and distinguished career at MUSC, and Gadsden Jr. grew up on campus, hanging out at his father's office and lab.

His path, however, lay not in the lab but in a then-unheard-of career: information security. And after a distinguished career of his own, Gadsden will retire Aug. 7 after 43 years at MUSC, including serving as interim chief information security officer.

He admits to having mixed feelings about retiring at this moment, because of how health care is poised for change.

"We have the tools now to fundamentally transform the way that we do business, the way that we treat patients and help them manage their health, the way that we educate our students, and the way that we conduct our research," he said. "We've got tools to make fundamental changes in how those functions are achieved, and we have the ability to imagine entirely new ways of doing business, entirely new ways of serving our constituency. It's very much an exciting time. I'm actually kind of sad that I'm retiring!"

Betts Ellis, chief of staff at MUSC Health, praised Gadsden for his contributions.

"He has been a role model for MUSC's values, including integrity, respect and teamwork," he said. "Richard has been a stabilizing force over the years as Information Solutions has faced leadership changes, as MUSC has undergone incredible growth and as the technology world has become increasingly sophisticated and complex."

Gadsden didn't plan to go into information security. He was a newlywed, finishing up his math degree at the College of Charleston, which he expected he might follow with a doctorate and then a career teaching math, when he got a job as a computer programmer in the Laboratory Information Center in 1978.

The lab was one of the first clinical departments on the MUSC campus to automate — for example, having test results flow through a central computer system and reported out to the attending physician.

Gadsden had taken a few courses in computer programming at CofC, but they didn't immediately interest him. Writing computer programs in the real world was different, though. Now he was solving problems for people, figuring out how to make connections happen. He was hooked.

Back then, there wasn't much specialization in the field, so Gadsden ended up also taking on the duties of what a cable technician would do today, helping to connect the lab system in the Quadrangle A building — now the site of Hollings Cancer Center — to the hospital.

"We ran cables through the elevated walkway into the hospital, up and down the halls and corridors and out to the nursing units so we could put green screen dumb terminals at the nursing units for the staff to look up results," he recalled.

From that first computer programmer job, he was promoted to manager of academic computing systems. Very quickly, computing began to change as networking caught on. MUSC connected to BITNET, a network that connected universities and supported such interactions as electronic mail. Most of the early users, Gadsden said, were tech people exchanging information with their counterparts at other universities.

There was another watershed moment in computing: "Things really started changing with the introduction of the personal computer," Gadsden said.

Early on, information security focused on internal security controls to ensure that no one physically on campus could access sensitive information they weren't supposed to have. But by about 1990, networking meant that people had to start taking a wider view of information security.

"When we first connected to the internet, it wasn't long before we had people from outside the institution breaking into our computer systems. The first attack that I can remember was on a computing system that was used for biomolecular computing research. We discovered there was someone in Sweden who appeared to be logging into that computer and running commands, and we didn't have any authorized users in Sweden," Gadsden recalled.

To put a stop to this, MUSC installed firewalls and other controls. Nowadays, Gadsden said, you can buy a powerful enterprise-class firewall straight off the shelf, and most new devices even have built-in firewalls. Back then, firewalls were more DIY, and MUSC used open-source code to build its own firewalls.

The challenges of internet security piqued Gadsden's interest. There was no information security office, and no one in charge of information security,

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Photo by Sarah Pack

Richard Gadsden on the site of the former Quadrangle A building – now Hollings Cancer Center – where he started his career at MUSC.

Photo Provided

The systems in MUSC's main data center shut down and covered in plastic in preparation for Hurricane Hugo's arrival in 1989. Nowadays, information technology is so critical to MUSC's mission that it wouldn't be shut down. Instead, a core team shelters in place during hurricanes to keep the system running.

SC ACS honors MUSC president with honored surgeon award

Dr. David J. Cole, FACS (center), MUSC president, joins Dr. Mark Jones, right, president of the South Carolina Chapter of the American College of Surgeons (ACS) and Dr. Cynthia Talley, vice president of the SC ACS and vice chair of Education in the MUSC Department of Surgery.
Cole was recognized by the SC ACS for his leadership and significant contributions to health, safety and welfare of patients in the Palmetto state. The award is the highest award that can be given by the SC ACS.

Photo Provided

Research

Continued from Page Six

I'm scared. I don't know what to do here,'" she recalled.

They started talking about his research, and she volunteered that mitral valve prolapse was a common problem for people with EDS. Norris asked her which gene was responsible for hEDS, and she responded that no one knew. "Pretty quickly in that conversation it turned into 'Do you want to rotate in the lab and find the gene?'" she said.

Gensemer began working in the lab on mitral valve prolapse and, on the side, sequencing the genes of a large family with multiple members with hEDS.

"From a scientific perspective, it was probably a dumb decision," Norris said. Others had thrown time and money at the question before, without results, he said. But they had a large family to work with. Norris looked at the odds of finding the gene with the information they had and decided that, while the odds weren't great, it was at least worth taking a shot.

The researchers had complete exomes from two distant relatives to work with. The exome is the part of a person's genetic material that contains protein-coding genes, and scientists believe that it's the source of the majority of genetic diseases.

The sequencing showed that the two individuals shared 75,000 uncommon genetic mutations.

That's a lot of mutations to sift through. But, Norris

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Full FDA approval, boosters and things to know about COVID-19 vaccine

By Bryce Donovan
donovanb@musc.edu

Delta. Gamma. Alpha. (Blue 22. Oma-HA! Set, hut!)

With all of the variants floating around out there these days you might think that Peyton Manning came out of retirement to work for the World Health Organization. Unfortunately, there are just so many of these variants that health's governing bodies have finally thrown up their hands and resorted to the Greek alphabet to keep track – because let's face it, we all know it's just a matter of time before Double Zeta is breathing down our necks.

As of July 16, according to U.S. Centers for Disease Control and Prevention, the Delta variant was the dominant strain of COVID – a sobering reminder that this virus is constantly trying to figure out a way to adapt and become more troublesome.

But there is some good news here: Though hospitalizations from the coronavirus are trending up, 97% of those who are being admitted are unvaccinated. So while the virus is getting craftier, it's still not happy when it runs into a prepared immune system.

"It's just a matter of time before it figures out a way around the current vaccines," said Danielle Scheurer, M.D., MUSC Health System chief quality officer, who oversees all things vaccine for the hospital system. "Right now, it's found a way to be more infectious, but it's not a worse disease. So it's not all bad news."

With the vaccine landscape still in a state of flux, we are periodically checking in with Scheurer to ask her the most pertinent questions that are hanging in the balance.

What you need to know about the COVID-19 vaccine – Part 8

Danielle Scheurer, M.D., MUSC Health System's chief quality officer, weighs in on issues related to COVID-19 and vaccinations.

Q. Percentage-wise, where is Charleston County in terms of who has been vaccinated?
A. Right now, around 58% of Charleston county residents age 12 and older are fully vaccinated.

Q. Who isn't vaccinated still, and is there a particular reason?
A. Mainly it's young people. The 18- to 40-year-old range is a big one. As for why they aren't, it's the same hesitancy issues that we've been dealing with all along. It's the fear of short- and long-term effects and still this misguided notion that COVID won't make them that sick. I think everybody has their own experience of somebody they know getting it and not getting that sick, so they're not that worried about it. That's a dangerous game to play. As for access, it certainly isn't an access issue anymore. If you want the vaccine, it is not hard to find a place to get it.

Q. So finding a place to get the vaccine is still a piece of cake?
A. We have made sure that any MUSC Health site or clinic has the capability to administer the vaccine on-site that same day. But because the uptake has stalled so badly – people just aren't getting vaccinated anymore – I worry that across the state, vaccine sites will start dwindling because of a lack of traffic. Luckily, I think places like retail pharmacies will always have it.

Q. When will kids under 12 be able to be vaccinated, and are we still thinking that's the best approach?
A. The trials are just taking a long time because the COVID prevalence has gone down over the past few months. That's a good thing for society, but for studies, the less data you have to work with, the slower the going is. That said, I think by the fall, we should see one for kids under 12.

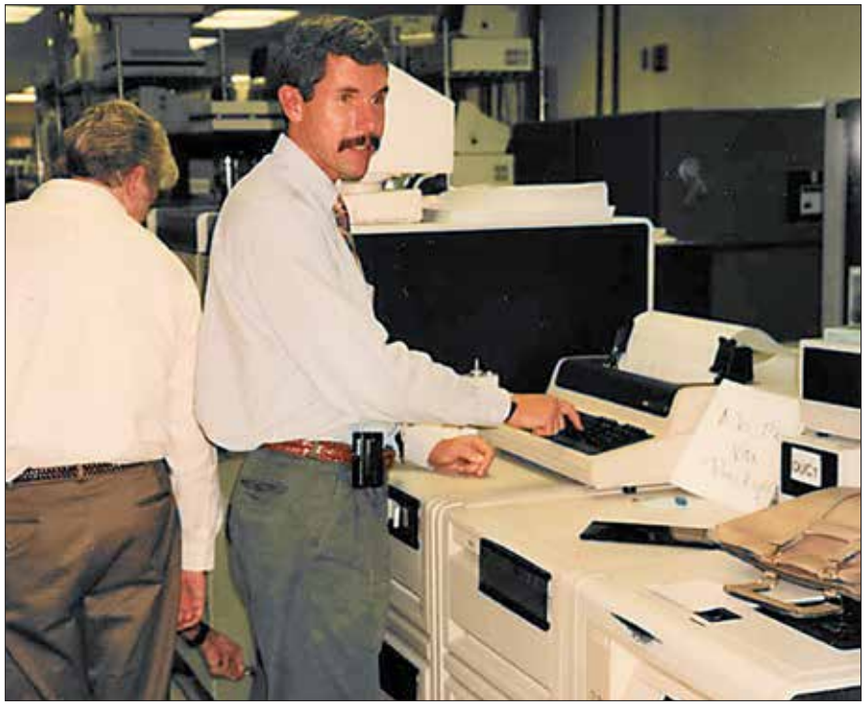
Q. Why haven't these vaccines – in particular Pfizer and Moderna – been given full FDA approval?
A. The FDA is taking the normal amount of time it would; it just feels like forever. If you look at the normal review process, it usually takes this long – or sometimes longer. It's not unheard of for these sorts of things to take years. Understandably, they can't just go, "Yep, we're good," but at the same time, you can't help but feel like we're in this time of extenuating circumstances, and maybe we don't have the luxury of being super methodical. So they're in a tough spot. But I will say this: The slow pace of approval is undermining public confidence in these vaccines.

Q. What makes this virus different from other respiratory viruses?
A. Almost all of these viruses have long-term symptoms, but the thing about COVID that is different is we can find traces of it in almost every organ once someone has been infected. That's not the case with the more common respiratory viruses. What makes it unique – and scary – is that COVID has figured out how to get in your kidneys and heart. It can go everywhere. It is a full-body virus.

Q. The subject of a booster has been tossed around a lot lately. What do you think the likelihood of having to have a third shot is?
A. I think it's any person's guess. And there's still no evidence that a third dose will even make a difference in most patients. But having said all that, I do think there will be some support to have a booster for those who need it – like elderly or immunosuppressed people.

Q. What should people be doing in their daily lives when out in public at places?
A. The CDC just changed its guidance and is saying that fully vaccinated people should wear masks in indoor public spaces in certain parts of the country. So, like in an airport or grocery store, you don't know who you're with. At the end of the day, it's still a little less than a one in two chance that the person in front of you or behind you isn't vaccinated. So I do think that it makes sense to still wear a mask indoors. Frankly, commercial flights haven't ever stopped requiring travelers – vaccinated or not – to wear masks on planes. And if you're wearing it on the plane, you might as well wear it in the airport. I do think people are having this internal conflict, and again, don't look now, but I'm afraid we're going to come back to the idea of avoiding indoor dining again. So yes, the smart play is just to be safe and wear a mask in indoor public spaces. If people need a more specific reason: Do they really want to risk getting sick? I certainly don't.

**Have a question you'd like answered? Email it to donovanb@musc.edu with the subject line "Vaccine Q."



Gadsden typing in the final shutdown command on MUSC's VAX-11/785 superminicomputer, which had served for a decade to support academic computing services to host MUSC's first email system and initially served as MUSC's connection to the BITNET network.

Photo provided

Computing

Continued from Page Ten

so Gadsden started learning and doing. Eventually, he built a team responsible for coordinating this need across the MUSC enterprise.

Information security has only gotten more complex since those early days. More systems became computerized. MUSC began expanding its physical presence, first off the Charleston peninsula into surrounding communities and now, across the state. It entered into affiliations with other hospitals and clinics. And smartphones and other internet-connected devices became ubiquitous.

"We're carrying more computing power in each of our phones now than existed across the entirety of MUSC when I started working here," Gadsden said.

The changes, Gadsden said, mean that "security really has become everyone's responsibility."

Information security was in the national spotlight earlier this year when Colonial Pipeline fell victim to a ransomware attack, and gas stations up and down the East Coast ran out of gas. The CEO testified before Congress that attackers were able to gain access because the virtual private network system in place didn't require multifactor authentication.

Health care systems have been victims, too, with more than 500 health care facilities being hit by ransomware last year. The University of Vermont Medical Center was hit in October. Leaders there say no personally identifiable information was taken, presumably because the IT team quickly took down all systems, including email and electronic health records. But it took a month to clean the system's 5,000 computers, and in that time, the medical staff reverted to paper records. In addition, about 300 employees were reassigned or furloughed because they couldn't do their jobs during the downtime, and some patient procedures were canceled or postponed.

Gadsden said that everyone – employees, students and even patients – must be conscientious about security. That means installing updates on time and thinking before clicking. With new federal regulations, patients now have immediate access to test results and visit reports. But, Gadsden said, patients should carefully consider how to safeguard that information if they pull it from the MyChart patient portal and upload it to an app or website.

"The one thing that really does concern all security professionals is the growing complexity of the environment," he said.

The overnight transition to "work from home" last year, after Gov. Henry McMaster declared a state of emergency as the COVID-19 pandemic ramped up, was another information technology and security challenge, but Gadsden said it was one that MUSC was well prepared for.

MUSC already had the core systems in place, including VPN and two-factor authentication, that could handle the rapid addition of thousands of users, he said. There were a few incidents, due to employees using unsecure networks, but the team is already looking at the next generation of technology to support a remote workforce even more securely, he said.

Similarly, MUSC Health was in a good position with telehealth, he explained, since it already had advanced telehealth capability when COVID began.

As Gadsden prepares to retire, he's excited to see what lies ahead for health care technology. Epic, the electronic health record platform that MUSC Health uses, was a major change for the health system. There are, however, disparate types of EHR systems in use across the nation, and the enthusiasm of a decade ago to get them to exchange information has tempered a bit as people have realized how difficult that will be. Nonetheless, Gadsden believes it will happen.

"The ability to exchange information more seamlessly over these national networks, between disparate systems, that's going to continue to evolve and improve. That's one of the important things the future will bring," he said.

Gadsden's own future is full of possibilities. He said he and his wife will probably take a year or so to adjust to retirement, while they decide if they want to remain in Charleston; move to western North Carolina, where they have extended family and a second home; move to the West Coast, where their son has settled into Silicon Valley life as a software engineer; or maybe move somewhere completely unexpected.

Ellis said the retirement is well-deserved. He noted the strong family legacy that Gadsden Sr. and Jr. leave at MUSC.

"His dad was a sterling gentleman and devoted nearly 50 years to MUSC. Richard is his dad all over again," Ellis said. "Here we have father and son who collectively have devoted nearly 100 years to MUSC. I know Richard's dad is looking down on him with great pride. Job well done."

Research

Continued from Page Eleven

pointed out, "uncommon" doesn't necessarily mean disease-causing.

"We all have literally hundreds of thousands of changes that are not common, but none of them are really causing anything," he said. A mutation could be considered uncommon if it's found in only 10% of the population, but since 10% of the population doesn't have hEDS, it follows that that gene wouldn't be the cause of hEDS.

Gensemer and Norris enlisted the help of Joseph Delaney, Ph.D., a cancer geneticist in the Department of Biochemistry and Molecular Biology, who helped them whittle the list down to 10 candidates.

"He sent us back the information, and he said in genetics, you rarely have these 'aha!' moments, but I think that this gene is the 'aha,'" Norris said.

Norris and Gensemer then sequenced the 10 suspect gene mutations across the family, looking for a gene mutation that would show up in every individual with hEDS.

And they believe they have found it.

But they're not stopping there. There are almost certainly more genes involved, and the researchers wanted more samples to work with. To do that, they needed to establish a patient registry, in which patients would voluntarily send saliva samples for testing. The registry, driven by four clinical coordinators at the South Carolina Clinical & Translational Research Institute (SCTR) and Natalie Koren in Norris' lab, opened in December and was immediately inundated with sign-ups. "In one day, we had the largest registry for hEDS in the world," Norris said.

"I remember that day – I went home and turned off my email because it just kept – ding, ding, ding," Norris said.

Along with the patient registration emails came the personal stories of people desperate for answers.

Search for answers

It often takes years, even decades, before patients receive a diagnosis of EDS. Diagnosis is based on a checklist, but getting to that checklist requires someone who can connect the dots of disparate symptoms.

"If you have mitral valve prolapse and you're seeing a cardiologist, and you dislocate your shoulder and you're seeing an orthopedic, and you have GI issues and you see a GI doctor – there usually isn't someone putting all that together. So patients will spend a really long time thinking they have all these different health issues – which they do have – but not know it's part of the syndrome," Gensemer said.

Photo by Sarah Pack

Graduate students and undergraduate interns meet with Miss America 2020, Camille Schrier, in the Norris lab.

And many medical professionals remain unaware of how severely EDS can affect people, she said.

"There is this misconception with a lot of doctors that EDS is just being double jointed, and that these patients aren't suffering with chronic pain, hospitalizations and surgeries," she said.

With the registry growing, Gensemer and Norris needed more help in the lab. He brought Rachel Biggs, an incoming Ph.D. student, onto the project. But then, instead of going the usual route of hiring a couple of lab techs to round out the team, Norris decided to find people at the cusp of their careers who were truly passionate about EDS.

"We need to build the community of people who understand the disease. Who better to do it than those with the disease?" he said.

He decided to implement a summer intern program for college students with EDS. After a nationwide search, Fenner, Luzbetak, Katherine Singleton from Clemson University and Deatra Bear from Colorado Mountain College were selected to come to Charleston.

Bear, who plans to go into nursing, said she's eager to get the word out about EDS. And she's excited about the research, which could lead to a simple blood or saliva test to diagnose EDS.

Early diagnosis is critical. Although there is no treatment as of yet, knowing that they have the disorder means patients can manage their symptoms through proactive physical therapy and lifestyle choices.

"For me as a kid, playing lacrosse and running competitively weren't the best choices," said Gensemer, who's since undergone numerous orthopedic and neurosurgeries.

Luzbetak was placed in gymnastics and dance when she was young because she was so flexible.

"I caused irreversible joint damage," she said.

When she hit puberty, she began deteriorating quickly. Her joints hurt so much that she was practically bedridden, yet doctors said it was just growing pains, she said. She finally got a doctor who suspected EDS but didn't feel qualified to make the diagnosis. Her family had to travel out of state to seek care.

"I ended up not being able to finish high school. I had to get my GED because the next four years were filled with constant doctors' appointments and hospital visits," she said

Bear, too, had to travel out of state for a diagnosis – all the way to Florida from Colorado. Her symptoms primarily manifest as gastrointestinal, and for that reason, doctors first suspected Crohn's disease. Because her stomach doesn't digest well, she has a feeding tube to ensure she gets proper nutrition.

Gastrointestinal issues aren't talked about as much in relation to EDS, she said, yet they've discovered that 80% of the people in the patient registry report some GI issues.

Fenner was diagnosed at age 9, after his more severely affected mother and sister were diagnosed.

"She sat me down and said, 'I know this is going to be hard to hear, but you can't play soccer anymore, you have to stop taekwondo, you can't be a Boy Scout – all these things are going to be really bad for your body.' So I turned to music and now I'm a double major in biology and music," he said.

Katherine Singleton, a Clemson student, was only recently diagnosed. She, too, did gymnastics and dance in addition to track, where coaches put her on hurdles because they were amazed at how easily she could swing her leg up and over.

But Singleton began experiencing extreme fatigue in high school. She would sleep and sleep and yet never feel better. Fatigue is a symptom of EDS, but it's probably better known as a symptom of depression, and that's what her pediatrician referred her to a psychiatrist for. This fed into a negative cycle, she said. Doctors were telling her she was depressed, and she wasn't getting treatment for her actual condition and was still tired, which then actually did start to make her feel depressed, which then reinforced the doctors' original assessment.

When she finally discovered the diagnostic checklist, she brought it with her to several specialists' visits but found that most doctors didn't feel confident in diagnosing her. Now, not only does she have a diagnosis, but she's contributing to the scientific knowledge about her disease.

Schrier said she found it empowering to see the group tackle this research question, particularly knowing how little attention it gets. She has been open about her diagnosis in hopes of bringing more awareness of and attention to EDS, even encouraging her followers to donate to the Norris lab, if they feel moved to do so.

Norris has high hopes for what the next three to five years will bring in terms of discovery and, possibly, treatment.

"By identifying a cause for the disease, we can now begin understanding the disease more thoroughly," he said. "This will help us diagnose earlier and provide clues for treatments. We remain optimistic that our discoveries will provide continued hope for those with hEDS and a better quality of life with less surgeries and less pain."

Schools *Continued from Page Four*

of MUSC Health's Back2Business partnership with the school district.

Fourth, take symptoms of respiratory infections seriously.

Eckard

"Testing and staying out of schools with even simple cold symptoms is going to be important," Eckard said.

The Centers for Disease Control and Prevention notes that the cold, along with other illnesses such as strep throat and the flu, has some of the same symptoms as COVID. The agency has an online coronavirus self-checker and recommends that anyone with COVID symptoms get tested.

But some parents have asked Eckard why we need to take any precautions to protect kids at this point. Most of us don't wear masks during flu season, so why now?

"One big difference between influenza and COVID is that families don't have a vaccine option for their younger children, at least right now. Some children are hospitalized and can develop severe disease, so it makes sense that we should do what we can to limit COVID transmission in the schools. I think we may have a different discussion when the vaccine is available for the younger kids," Eckard said.

Olympian *Continued from Page Two*

most important thing is having someone that helps develop that plan."

Medication can also help some people. But that's not something an Olympian can turn to in the middle of a competition, for a variety of reasons. Pelic said Biles appears to have made the best choice in a difficult situation.

"This just puts everything in perspective. As a society, we need to think about how we prioritize what's important. If Simone continued to compete, she could have been physically hurt or further negatively impacted her mental health. She did the brave thing. At the end of the day, the Olympics are important. But are they really as important as your own mental, medical or physical health?"

MUWC 2021 scholarships: Applications due Sept. 3

The Medical University's Women's Club (MUWC) is offering its annual scholarships to MUSC students from all six colleges for the 2021-22 academic year. A total of $15,500 will be awarded this year. All full–time MUSC students (second year and higher) are eligible to apply.

The deadline for submission is 5 p.m., Friday, Sept. 3. Completed applications should be submitted via email to muwcscholarship@gmail.com.

For information and a link to the online application, please visit https://web.musc.edu/resources/womens-club/scholarship.

Heat *Continued from Page Seven*

like more people to understand its value and potential in improving the environment and communities we live in," said Konrad.

Event co-speaker Jennifer Runkle, Ph.D., an environmental epidemiologist at North Carolina State University, spoke about the consequences of extreme heat and its direct and indirect impact on people's health, especially during COVID-19.

According to Runkle, a warming climate can lead to increased premature heat-related deaths. Cold and hot temperature extremes can worsen conditions, such as diabetes, cardiovascular disease and mental health issues and pregnant women and their babies can be affected by hotter than average temperatures. Certain individuals with co-morbidities, by virtue of the medications they take, can have increased sensitivity to heat stress. Health effects of extreme heat, even small deviations from seasonal average temperatures in the summer are related to increases in population-level morbidity and mortality.

Runkle also spoke about the strain of 2020 with the pandemic, social injustices and natural disasters caused by the climate crisis. "The COVID-19 pandemic is a reminder that health risks must be continuously addressed as high priorities. The science is clear that the Earth's climate will continue to change, and these changes will have adverse consequences to people's health."

Janice Barnes of Climate Adaptation Partners shared insights into what the City of Charleston is doing as a participant in several Charleston heat research programs, including Charleston HeatWatch. According to Barnes, Charleston is one of four cities in the Southeast selected to participate in this research and among a cohort of U.S. cities selected to study urban heat.

MUSC Sustainability and Recycling's Rachel Whitbeck, clockwise from top left, leads the Q&As with event speakers Janice Barnes, Climate Adaptation Partners; Dr. Jennifer Runkle, Environmental Epidemiology at N.C. State University; and Christine von Kolnitz, MUSC Sustainability and Recycling, as part of the July 14 MUSC Conversation Cafe event midday discussion on extreme heat and health.

MUSC plays an active role in this project due in large part to its commitment to transforming the university campus into a place of optimal healing and learning through the creation of an urban landscape that invigorates, inspires and teaches through nature. This includes the Medical District Greenway as well as the MUSC Arboretum that boasts more than 2,500 trees located throughout the 90-acre main campus, a collection made possible with the support of individual donors who share the belief in the innate restorative power of nature and healing and wish to bring that healing to patients, families and caregivers.

Barnes also mentioned the value of incorporating heat-reduction strategies to counter identified heat risks in urban areas. As organizations and government agencies invest funds in building projects and improvements, landscaping spaces and future planning, she said that it's also important to consider surface temperatures and select complementary materials for design.

Christine von Kolnitz is the director of MUSC Sustainability and Recycling and a proponent of providing a sustainable and healthy MUSC campus. She and several MUSC employees will serve as volunteers in this weekend's Charleston HeatWatch data gathering, working with the City of Charleston and its team.

"I look forward to helping to gather crucial data on heat in the Charleston region," von Kolnitz said. "This data will inform community leaders, businesses and the public in making many future decisions as to where to target resources to help any population that is not currently able to mitigate the health consequences of extreme heat."

For more information about the CISA Heat Watch program, visit https://cisa.sc.edu/ or for information about HeatWatch Charleston 2021, visit https://www.charleston-sc.gov/2513/HeatWatch-Charleston-2021.