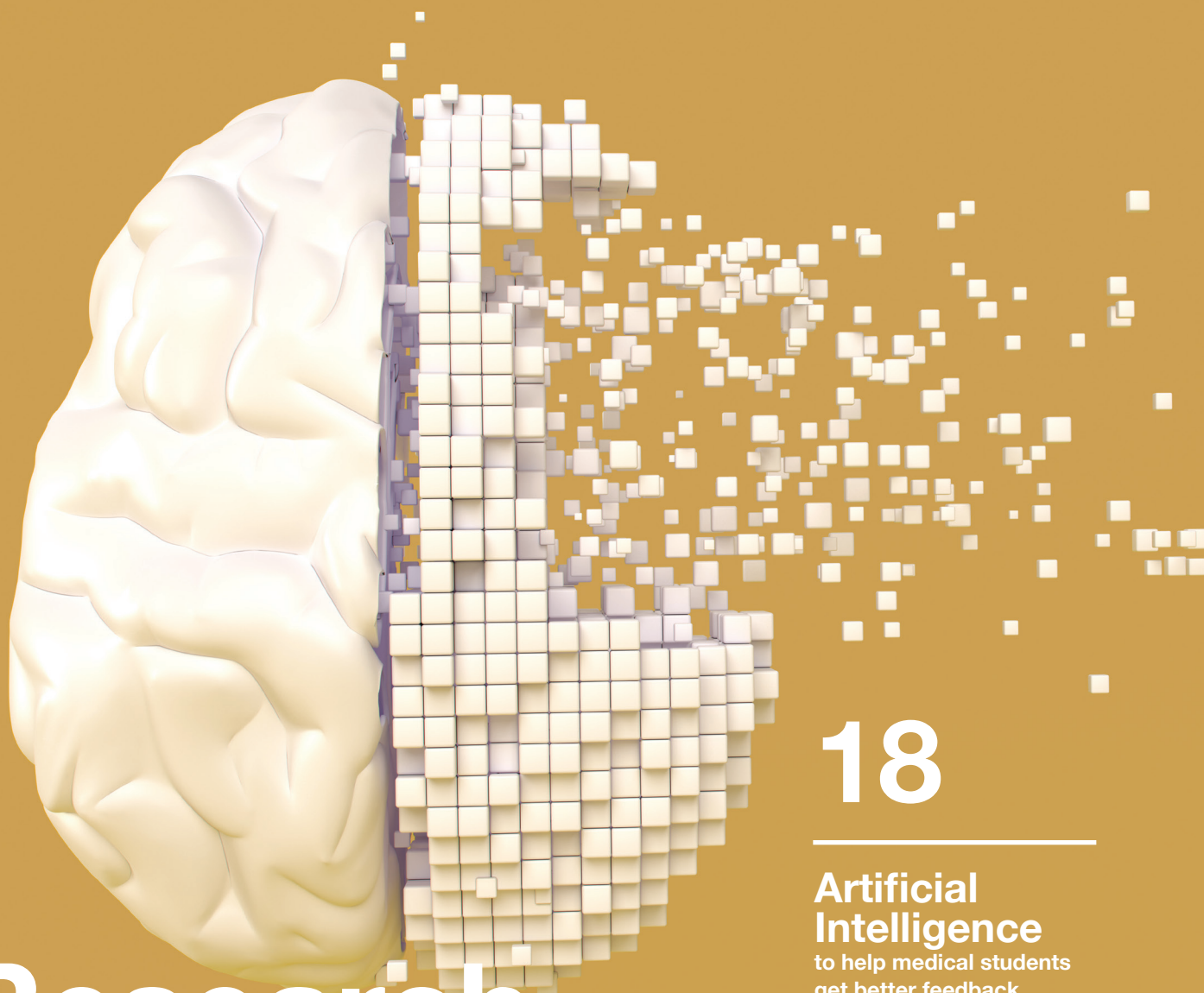


# Vital Signs

Boonshoft  
School of Medicine  
WRIGHT STATE UNIVERSITY



## Research Discovery

The Boonshoft School of Medicine and Wright State University have been recognized as a hub for cutting-edge research impacting people and communities in our area and around the world.

# 18

**Artificial  
Intelligence**  
to help medical students  
get better feedback

# 04

**Gene Therapy**  
for Canavan disease

# From the Dean

The Boonshoft School of Medicine and Wright State University have been recognized as a hub for cutting-edge research impacting people and communities in our area and around the world.

Upon my arrival to the Boonshoft School of Medicine (BSOM) over a year ago, I developed a vision for the next decade by focusing on providing an even greater impact on the community and those we serve. Building upon our research infrastructure to yield increased medical discovery is one very important way BSOM can achieve that vision and improve the health and life of people in the Miami Valley and beyond. Research is also a primary pillar of BSOM's overall strategic plan, and factors greatly into the direction of the school in the near and distant future.

Charles Kettering, one of Dayton's entrepreneurial trailblazers from the last century, said, "research means that you don't know, but are willing to find out." Like the great generations of Dayton scientists whose work precedes us, our BSOM community engages in this activity every day and is making great strides in patient care and treatment of disease. In this issue of *Vital Signs*, I am proud to highlight some of these efforts.

We share a story about a professor in biochemistry building on her postdoctoral work with muscle disease by investigating the role of a protein deficiency in patients with Duchenne muscular dystrophy. Her research could affect the development of new therapies for patients with this disease and similar muscle-wasting conditions.

A nearly 20-year journey led a neurosurgeon to BSOM as a professor of internal medicine and neurology, bringing with him research leading to a first-in-human clinical trial for Canavan disease, a first for Dayton Children's Hospital. Learn how this trial is affecting the quality of life for impacted children in the United States and abroad.

Improving health outcomes affects the overall health of our communities. Examining biases that may exist in health care, and their effect on health outcomes, is critical, and especially important for those in medical education to understand. Read how two BSOM OB/GYN professors and physicians collaborated with colleagues from medical schools across the country to research, create, and share best practice strategies for incorporating health equity into medical education.

Fewer than 15 percent of medical schools offer a research track in orthopedics, and BSOM is one of them. Learn how BSOM's elective research residency program in orthopedics has significantly boosted research production and our national visibility. This program is producing excellent surgeons with an understanding of evidence-based medicine through research experiences. Read how students are also benefiting from the residents' work.

We all understand that it's not always what is said, but rather how, that matters. Several BSOM students discovered this when they learned the method of delivery of COVID-19 information, particularly to people for whom English is not their primary language, affected trust in the accuracy of the information. This research can help the medical community best share health information with refugees.

As BSOM enters its fifth decade, right now is an important time. Abraham Lincoln said, "The most reliable way to predict the future is to create it." The people and work highlighted in this issue are helping BSOM create our future and attain strategic goals and, more importantly, fulfill the hope for a better future for those in our community and beyond.

  
Valerie D. Weber, M.D., M.S.



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# Vital Signs

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## Issue In Depth

# Gene therapy for Canavan disease

**Dayton Children's Hospital is the first in the world to use a new gene therapy to treat a patient with Canavan disease, which earned national attention.**

In April 2021, a 4-year-old underwent a novel brain surgery at Dayton Children's Hospital. With four catheters inserted through the little boy's skull, the surgeon injected into his brain a fluid containing over 37 trillion viral particles, each containing DNA for a human gene, a first-of-its-kind experimental gene therapy for Canavan disease. For comparison, this huge number of microscopic particles injected into the brain is even more than the number of stars in the Milky Way galaxy.

Canavan disease is a rare genetic neurological disease that typically presents in infants between 2 and 12 months of age. It destroys vision, speech, and motor functions. Symptoms include seizures and an abnormally large head, which appears floppy due to poor head control.

Reported worldwide, Canavan disease is more frequently found in children of Ashkenazi (Eastern European) Jewish descent, when both parents are carriers of the gene that causes the disorder. Though the precise prevalence is unknown, there are estimated to be fewer than 500 children with Canavan disease today in the United States. Most do not live past age 10.

The experimental surgery was performed by Robert Lober, M.D., Ph.D., an associate professor with the Department of Pediatrics at BSOM and a pediatric neurosurgeon with Dayton Children's Hospital. Assisting Lober was Christopher Janson, M.D., assistant professor in the BSOM Department of Neurology, and assistant professor with the Department of Neuroscience, Cell Biology, and Physiology at Wright State and BSOM. Janson is also a neurologist with Premier Health in Dayton.

Janson and Lober are the co-principal investigators on a Canavan disease clinical trial, a first-in-human clinical trial taking place at Dayton Children's. The two connected on the trial in 2019, but it is work that has been in the making for nearly two decades.

### THE RIGHT PEOPLE AT THE RIGHT TIME

In the 1990s, Christopher Janson was a student at the Yale School of Medicine, and the gene responsible for Canavan disease had just been discovered. Gene therapy, especially for neurological disorders, was still a new concept. A pair of Yale researchers, Matthew During, M.D., and his associate Paola Leone, Ph.D., were working on gene therapy for Parkinson's disease. Janson's interest in gene therapy and neurosurgery drew him to their research, and he began working in their lab. During and Leone would later become his mentors.

"I sort of fell into this work, with the right people at the right time," said Janson. While working in During and Leone's lab, a somewhat serendipitous event occurred. Two infants from Connecticut and New York were diagnosed with Canavan disease. The families, devastated and desperate to help their children, were aware of During and Leone's work with gene therapy and offered to provide funding for Canavan disease research.

The families, the Karlins and Sontags, started several nonprofit research foundations and raised significant funds, which gave the research momentum. "Quickly, we went from knowing the gene responsible for Canavan existed, to cloning it in the lab, and creating a viral vector suitable for use in a human. Literally bench to bedside in two years," said Janson.

The initial procedure involved a nonviral vector called LPD, made with a collaborator at the University of Pittsburgh, but later iterations used the adeno-associated viral vector (AAV), a very small nonpathogenic virus that does not cause illness, to deliver small amounts of genetic material to neurons in the brain. In 1996, New Zealand native During traveled to his home country to oversee the first human gene trial for Canavan disease with the nonviral vector on Lindsay Karlin. Two years later, During, Leone, and their team performed the same procedure in the United States on Jacob Sontag.

Results were positive from both procedures. Karlin showed improved vision and better head control, and the Sontags remarked their son was like a completely new person. This garnered media attention. In 1998, *The New York Times Magazine* published a story about the Karlins and Sontags funding the research, the outcome of the procedures, and the work being done by During and Leone. Sontag and his mother were featured on the cover.

### THE GAME-CHANGER

Following graduation from medical school, Janson deferred residency to work in a post-doctoral position in human gene therapy with During and Leone. In 2000, they relocated to Thomas Jefferson Medical School in Philadelphia. Janson helped secure funding from the National Institutes of Health (NIH) to continue their human gene therapy research for Canavan disease, together with private foundations.

Gene therapy trials on children continued using AAV, which were also in preclinical testing for Parkinson's disease. During 2000–05, Janson and Leone collaborated on an NIH-funded clinical trial, the first gene therapy for a neurodegenerative



# Issue In Depth

disorder, spearheading other work in the field. They saw improvements in behavior, such as fewer seizures, but patients were not being cured. The trials proved they could change the biochemistry of the brain, a very important finding, but they were not able to target the primary cells of interest due to limitations of viral vector technology at the time.

Canavan disease is known as a leukodystrophy, because the so-called white matter is primarily damaged. White matter consists largely of myelin, a protective sheath for the brain, required for effective neurotransmission. A mutation to the ASPA (aspartoacylase) gene affects the gene’s ability to properly break down the enzyme NAA (N-acetyl-L-aspartic acid) which builds up, causing the myelin to fall apart. “The brain becomes full of holes and waterlogged like a sponge,” said Janson. Unfortunately, the first generation of viral vectors had targeted neurons in the so-called gray matter, and selectively targeting white matter remained an elusive goal.

In 2016, a colleague of Janson and Leone discovered that changing one amino acid in the AAV capsid (or outer shell) drastically changed its behavior and the cells it targeted. They were able to direct the new viral vector to oligodendrocyte cells, essential for the production of white matter. Tested in animal models, the new viral vector with ASPA, directed at the oligodendrocyte cells, cured Canavan disease in mice. Janson and Leone published this latest and biggest discovery. This new version of AAV gene therapy was anticipated to be a game-changer. The discovery was licensed to Pfizer, which funded additional research on viral vectors but opted not to commercially develop Canavan gene therapy.

Soon after publishing their new findings in 2016, Leone, who was in New Jersey with Rowan University School of Medicine, was approached by the Landsmans, a family from New York with two children recently diagnosed with Canavan disease. They found Leone through social media and the article she published with Janson about the new viral vector and gene therapy.

Similar to the families Leone had worked with before at Yale and Thomas Jefferson, the Landsmans were desperate to help their children, and offered to assist with funding if she would pursue a new Canavan disease clinical trial. Leone promptly reached out to Janson, who agreed to be the lead physician for a new clinical trial in 2017.

Janson, who was with University of Illinois–Chicago College of

Medicine, spent the next few years preparing for the new trial. He helped to secure preliminary funding, designed the clinical protocols, and worked with a new clinical team on obtaining approvals from the Food and Drug Administration (FDA). The Landsmans founded the Cure Canavan Fund in to help raise money, and additional children joined the Landsmans as trial participants.

Additional FDA requirements and issues with institutional support created unexpected delays and significantly increased the costs. Janson and the families, ready to move forward, were getting anxious.

### DAYTON—THE PERFECT FIT

Robert Lober, M.D., Ph.D., came to Dayton and BSOM in 2015 from California, where he was an assistant professor of neurosurgery with Stanford Medicine. “Right away, BSOM was interested in helping me get established with research,” said Lober. His research interests include pediatric brain tumors and using advanced imaging and molecular techniques to develop treatments.

In 2019, Janson contacted Lober, whom he had met a few years earlier during a facilities tour in Dayton. “I reached out hoping he would remember who I was,” said Janson. He shared with Lober the details of the Canavan disease trial and his need to move forward. Lober immediately felt Dayton would be a good location for Janson’s clinical trial. “The great facilities at Dayton Children’s Hospital, and BSOM’s desire to build and support more research infrastructure—it’s the perfect fit,” added Lober.

Following a presentation on the Canavan disease trial by Leone and Janson, Dayton Children’s agreed to support the project. Janson arrived in Dayton from Chicago in December 2019, bringing with him a newly awarded NIH grant on the pathophysiology of Alzheimer’s disease, which used some of the same recently discovered AAV technology proving successful curing Canavan in animal models.

Although COVID-19 created another delay, by 2021 Lober and Janson were cleared to proceed. In April 2021, the procedure was performed on the Landsman’s oldest son Benny. Later that spring it was performed on the younger sibling, Josh. In the summer of 2021, a young girl from Italy also received the gene therapy surgery. Leone was present for these procedures. In May of 2022, the procedure was performed on a young boy from Russia.



Robert Lober, M.D., Ph.D., (top left) and Christopher Janson, M.D., (top right) with the Pronin family, including (lower left to right) son Artyom, mother Alla, and son Sergei. The family traveled from Russia to Dayton, where Artyom was successfully administered gene therapy on May 17, 2022.

Dayton Children’s is the first hospital in the world to use this new gene therapy on a Canavan disease patient, which earned national attention. Stories have appeared in *People Magazine*, TODAY Show, and the *Jewish Observer*. The coverage led to further financial support for the trial. From May to June 2020, *People Magazine* readers donated \$200,000 to the Landsmans.

At regular intervals after surgery, the treated children will return to Dayton for assessments, checking their neurological status and development, measuring motor function and learning capabilities appropriate with their age. The team is also using advanced imaging to directly measure brain volumes and myelin content. The data collected is compared to identical assessments done pre-surgery.

Janson and Lober are pleased with how the children are progressing. “Follow-up data in treated patients demonstrate favorable safety and tolerability with encouraging initial efficacy results,” said Lober in a February 2022 Businesswire.com story. They are looking forward to continuing to progress with the study and to perform procedures on more children.

Lober has been overwhelmed by the support from BSOM’s clinical partners for the trial, and for the families when they arrive in Dayton. Dayton Children’s even built a special space for clinical evaluation of trial participants. Lober added, “It has been awesome to see all the clinical partners align with the academic side on this!”

### LOOKING AHEAD

The investigators have heard from new patients and their families across the country and around the world, from North and South America, Europe, Asia, and the Middle East.

At this time, the investigators are collaborating with Myrtelle,

Inc., a gene therapy company in Massachusetts funding the continuing study. In 2021, Myrtelle entered into an agreement with Pfizer, Inc. to develop and commercialize their patents on AAV-based gene therapy. The company is named after Dr. Myrtelle Canavan, the Harvard-affiliated pathologist who first described the clinical disease.

Janson is proud of this trial. “We started this ourselves as a kitchen table project, using patient funds to get it going and FDA cleared,” said Janson. “I’m confident that this gene therapy will lay the foundation for future trials of many other genetic diseases. There is already proof-of-principle, but a lot more work needs to be done before it becomes mainstream. The current position of gene therapy is analogous to the position of aviation at the time of the Wright brothers. It will definitely take off; it’s just a matter of time.”

Along with a treatment for Canavan disease, and providing hope for the children and their families, Janson and Lober believe information from this trial will help with developing treatments for more common diseases like Parkinson’s and Alzheimer’s. Lober added, “This clinical trial puts BSOM and Dayton, Ohio, on the world map, and extends our reach to help many more people all over the world. I’m honored and grateful to do my part for these patients, in order to improve their lives and advance the state of the art of gene therapy.”

—LISA COFFEY



## A Closer Look

# A passion for biochemistry research could help people with muscular disease

Muscular dystrophy is a group of inherited diseases characterized by weakness and wasting away of muscle tissue. Duchenne muscular dystrophy (DMD) is one of nine types of muscular dystrophy, and one of four conditions known as dystrophinopathies.

Mutations in the gene coding for the protein dystrophin, responsible for maintaining the structural integrity of muscle membrane cells, causes membrane leakage and muscle wasting. People with DMD suffer physical disability, immobility, and, often, premature death. Currently, there is no cure.

Research underway at Wright State by Hongmei Ren, Ph.D., assistant professor of biochemistry and molecular biology, may

lead to the development of a treatment for DMD patients.

Ren's research focus is lipid metabolism and muscle biochemistry and physiology. In a recent publication, Ren revealed the critical role of the lipin1 gene in maintenance of muscle membrane integrity. She pointed out a deficiency in lipin1 alone can lead to compromised muscle membrane integrity and myopathy, as seen in people suffering from muscular diseases like DMD.

In 2021 Ren received an R01 grant from the National Institutes of Health (NIH) National Institute of Arthritis and Musculoskeletal and Skin Diseases, and an Idea Development Award from the Department of Defense—totaling \$2.4 million—to research

gene therapy for DMD. "This will enable us to explore new research directions and help patients with DMD and other muscle-wasting conditions," said Ren.

The awards were received in collaboration with her research team—Mark Rich, Ph.D., professor of neurology with BSOM, and professor of neuroscience, cell biology, and physiology with Wright State and BSOM; and Andrew Voss, Ph.D., associate professor of biological sciences at Wright State.

Ren joined the faculty at Wright State in 2016. "Wright State has an ideal research environment, especially in muscle research," she said. Ren says she is inspired by the impact of her work and enjoys sharing that inspiration. "I like to pass on my passion for biochemistry research to my students and help them pursue their careers in biological science," Ren said. Many of her students have done remarkable and award-winning research, and several work for pharmaceutical companies, researching treatments for muscle disease. "Biochemistry is a science exploring cellular mechanics of various life processes. These insights can be applied via gene therapy, and other avenues, to improve lives," added Ren.

Ren completed her postdoctoral training with the Cardiovascular Research Center at the University of Kentucky and earned a Ph.D. from the Institute of Brain Chemistry and Human Nutrition at London Metropolitan University. She earned her undergraduate degree from London Metropolitan University.

*"We have found lipin1 therapy can reduce a wide range of symptoms, improve muscle function, and slow disease progression of dystrophic muscle"*

"We have found lipin1 therapy can reduce a wide range of symptoms, improve muscle function, and slow disease progression of dystrophic muscle," said Ren. The research grant and awards Ren and her team received will enable further



Hongmei Ren, Ph.D.

exploration of lipin1 as a novel alternative or complementary gene therapy in dystrophic muscles.

Ren said she has been approached often by families of patients with muscle disease, hopeful her research can help improve the lives of their loved ones. "I am proud of what I am doing. I hope my knowledge and research can help patients with DMD increase their lifespan and improve their quality of life," Ren said, adding, "We may develop a treatment for DMD." —TOM BYERLEIN



# A Closer Look

## Using mortality and morbidity conferences to help examine bias and improve health outcomes

Various sources have published findings highlighting significant disparity in health outcomes between white patients and patients of color. Maternal mortality and morbidity continue to occur at unacceptably high rates in the United States, and rates are significantly higher among communities of color. Even when adjustments are taken into consideration for confounding factors, such as socioeconomic status, health outcomes for black patients are still worse than those for white patients.

Mortality and morbidity conferences, which are departmental reviews of cases with less-than-ideal outcomes, have long been a part of medical education in nearly every specialty. They first took place in 1904 with the evaluation of surgeon competence.

Given the central role that morbidity and mortality conferences play in medical education and quality improvement, they serve as a natural stage for the examination of systematic inequities in health care. There has been an increasing desire to incorporate an equity component into these conferences. Despite the desire and drive, there is little published guidance around best practices.

“Everyone is talking about health care disparities within obstetrics and gynecology; people are very motivated to address it, but very few know how,” said Keith Reisinger-Kindle, D.O., OB/GYN faculty at BSOM and OB/GYN physician with Wright State Physicians (WSP).

This realization, and an intense interest in addressing social injustice and its effects on health care and patient outcomes, inspired Reisinger-Kindle to create a model to incorporate equity into morbidity and mortality conferences.

After unofficially discussing this issue and sharing best-practice health equity activities among colleagues for nearly a decade, Reisinger-Kindle officially organized a group in 2021. Included in this group was fellow WSP OB/GYN physician David Dhanraj, M.D., BSOM chair of OB/GYN and newly appointed associate dean for clinical affairs. Other members represented various leading health care organizations, including Massachusetts General Hospital, Brigham and Women’s Hospital, Tufts Medical Center, and University of Massachusetts Memorial Medical Center.

The group began what would be a six-month process that started with documenting and comparing examples

of what each organization does to promote health equity during morbidity and mortality conferences.

BSOM OB/GYN organizes health-equity-specific morbidity and mortality conferences quarterly, in addition to regularly scheduled morbidity and mortality conferences. Residents, medical students, faculty, nursing staff, and social workers attend. Following a discussion of case details and didactics, the format becomes primarily interactive, with small group breakouts and activities, such as social identity wheel mapping, privilege walks, and analytical dialogue sessions.

Cases at BSOM are chosen by faculty trained in anti-racism education, social justice dialogue facilitation, and social identity-based conflict resolution, and alternate between obstetrics and gynecology cases, to allow for sufficient depth of case and topic analysis. Previous topics have included: Introduction to Language and Concepts: Examining Racism Beyond Implicit Bias, How Racism Impacts Housing Inequities and Worsens Health Outcomes, and Language Matters: How “Microaggressions” Result in “Macro” Inequities.

Tufts Medical Center OB/GYN department holds quarterly health equity rounds during grand rounds. Department faculty, nursing staff, residents, and medical students attend. Other departments are invited based on the topic. Sessions begin with a reflection and take place within a “brave space,” a space where participants can be open and honest, without judgement or fear of punishment. Interactive surveys allow those in attendance to be polled anonymously.

HEqR (health equity rounds) are a key component of the health equity program at Harvard Medical School’s combined OB/GYN residency program at Massachusetts General Hospital and Brigham and Women’s Hospital. Cases are selected by residents, with approval from department quality, diversity, equity, and inclusion leadership, from suggestions provided by clinical staff, or via the anonymous “(In)Equity Inbox.”

At the University of Massachusetts Memorial Medical Center, health equity analysis has been built into the OB/GYN monthly departmental morbidity and mortality conferences. Before presenting a case, residents are given guidance from the department’s director of diversity, equity, and inclusion on identifying opportunities to advance health equity from details within the case.

A review of the activities of each organization resulted in a list of 10 recommendations, “tips and tricks” as Reisinger-Kindle refers to them, or a framework to use for building a mortality and morbidity conference format that incorporates principles of health equity. This list, with additional supporting documentation, was submitted to The American College of Obstetrics and Gynecologists in 2021 and published in

the journal *Obstetrics & Gynecology* that December.

“Institutions do things differently, but using the main premise behind the tips and tricks will help them reach a similar goal,” added Reisinger-Kindle.

One of the group’s recommendations involves permitting active patient participation by inviting patients to physically be present at the conference, or directly sharing their words and feelings. “Hearing from patients directly prevents bias and gives them an opportunity to call us out when we’re wrong,” said Reisinger-Kindle.

For Reisinger-Kindle, and the entire group, the hope is that sharing defined goals for successful implementation will allow other institutions to apply health equity analyses into their educational conferences, to continue to address inequities in care as a community and a profession.

Reisinger-Kindle added, “We need to be learning from the bad outcomes, of course to prevent them, but also with a new perspective that centers on bias to create better outcomes. My biggest fear [is that] we keep talking about it, but things never get any better.”

Reisinger-Kindle, who is formally trained as a social justice and anti-racism facilitator and educator, initiated anti-racism dialogue training for the OB/GYN residents in 2019, soon after joining BSOM as an OB/GYN professor and associate director of the OB/GYN residency program. Since that time, the program has rapidly grown, more facilitators are being trained, and offerings are being made available to more BSOM faculty, staff, and students. —LISA COFFEY

### 10 recommendations to incorporate health equity

- Avoid only selecting cases that fulfill stereotypes
- Invite an inclusive and multidisciplinary list of attendees
- Lead discussions using a trained facilitator
- Create an environment with a focus on “Just Culture,” an assumption that those involved in providing care are intending to do their best
- Center the patient’s voice and permit active patient participation
- Analyze beyond implicit bias
- Be purposefully intersectional, understand the complexity of prejudices a patient may face, and be aware to not use language, in chart notes for example, that may bias other providers toward the patient
- Acknowledge the full spectrum of racism’s harmful effects
- Identify ways to interrupt problematic systems
- Organize post-session debriefs and feedback



# Faculty in Focus

## Clintoria Williams' research receives international acclaim

Clintoria R. Williams, Ph.D., FAHA, is part of an up-and-coming group of biomedical researchers. She has been featured on the cover of *The Physiologist Magazine*, an international publication of the American Physiological Society. This is one of many achievements for Williams, who made national and international news with her research that has linked zinc deficiency to high blood pressure.

The *Physiologist Magazine* named Williams as among the “now” generation of scientific researchers. Her research has been published in the *American Journal of Physiology – Renal Physiology*, and her lab’s findings have been featured in articles by *Science Daily*, *Medical News Today*, *Cardiovascular Business*, and *The Health Site*, among others.

Williams gained recognition through her experiments and data generation, which earned her a National Institutes of Health scholarship and Minority Access to Research Careers for Undergraduate Students Training in Academic Research (MARC U\* STAR).

“Taking biology lab courses as an undergraduate student birthed an appreciation of science and the interesting and provocative questions that remained unanswered,” Williams said.

Williams is an assistant professor in the Department of Neuroscience, Cell Biology, and Physiology and the director of the Small Animal Physiology Core. She has been with Wright State since 2018 and has played an integral part in helping her students grow into competent, effective researchers. She works hard to raise marginalized voices within medicine.

Williams’ research is centered around cellular and molecular physiology, vascular pathophysiology, and renal pathophysiology. She has published 16 articles on a variety of topics including the role of immunosuppressive drugs in causing cancer and kidney disease, the effect of zinc on the kidneys, and the effect of nutritional intervention on kidney health.

Williams’ research examines hypertension, a major risk factor in chronic kidney disease progression, which leads to end-stage kidney failure. Uncontrolled blood pressure is still present in almost 90 percent of chronic kidney disease patients despite the availability of several types of drugs that combat hypertension. To combat this, Williams’ lab has worked to identify cellular and molecular mechanisms that drive hypertensive kidney damage. Exploiting the underlying mechanisms

could serve as the foundation for new treatments and drug targets for both hypertension and kidney disease as a whole.

Chronic kidney disease and hypertension are frequently accompanied by a deficiency in zinc, which can have negative consequences on the cardiovascular system and inflict further damage to the renal system. Williams’ research determined that hypertension induced by zinc deficiency is a consequence of kidney dysfunction. Specifically, Williams has found that dietary zinc restriction in animals promotes hypertension by driving renal sodium retention. This was reversed by replenishing the diet with zinc. These significant findings establish the physiological role of zinc in blood pressure control and highlight a novel approach to blood pressure management.

Currently, Williams works with a team of undergraduate, M.D., and Ph.D. students to assist with research. Williams’ philosophy of “lifting while she climbs” has enabled her to help K–12 students along with her research team. Williams’ students have won scientific poster awards and travel awards to national scientific meetings. Her students have significantly contributed to a variety of



Left: Clintoria R. Williams, Ph.D., FAHA. Top right (from left to right): Kajal Davi, Ryan Elam, and Clintoria Williams. Bottom right (from left to right): Kajal Davi, Tara-Yesomi Wenegieme, B.Sc., Clintoria Williams, Ph.D., FAHA, Ryan Elam, and Cindel Lynn K Rudy.

publications. Williams said that seeing her students succeed is encouraging. She is looking forward to continuing to work alongside others to increase diversity, inclusion, and equity in the scientific community.

Williams said that her long-term research goal is to reverse or prevent hypertension and slow chronic kidney disease. Her lab has pioneered the understanding of zinc’s role as a diet-related regulator of renal blood pressure homeostasis.

Alongside her students, Williams has worked to study calcineurin inhibitors, a vital immunosuppressive therapy in the management of conditions that could cause inflammation. Calcineurin inhibitors often cause major side effects that can lead to kidney damage and hypertension. Williams’ research has found that

calcineurin is not a singular protein with a singular function. By selectively modulating calcineurin’s activity, it could be possible to preserve the kidneys while maintaining immunosuppression.

To Williams, research is only half of her passion. She is also incredibly dedicated to bringing minority voices and perspectives to research and development of treatment. She is currently the president of Black in Physiology Inc., a nonprofit organization that promotes Black scientists in physiology-related fields. The group encourages conversations around diversity and inclusion in the field of physiology. Additionally, she is the president of the Dayton American Heart Association.

In 2017, she was a participant in the Research Leaders Academy for the American Heart Association. She was named a fellow of the American Heart Association and served on the Council on the Kidney in Cardiovascular Disease.

Along with her appointed positions, she has also received a variety of awards. In 2017, she received the PhUn Week Five-Year Participant award from the American Physiological Society. In 2020, she was granted the Faculty Award for Excellence in Early Career Achievement by Wright State University. In 2021, she received the Renal Section Young Investigator Excellence in Research Award from the American Physiological Society. —MICAHA KARR



# 1,000 Words



Faculty, residents, graduate students, and medical students gathered in the Wright State University Student Union Apollo Room on January 6, 2022, to present their research at the annual Boonshoft School of Medicine Research Symposium.





## Forming better differential diagnoses using metamemory

Among the most common—and serious—types of medical errors are failures of diagnosis. Sometimes these errors occur because doctors don’t even consider the proper diagnosis on their mental lists of possibilities.

Researchers at BSOM are studying how well young doctors can expand those lists of differential diagnoses by using mental techniques to help them access memories from their medical training.

Frederic Stuart Leeds, M.D., an associate professor of family medicine at BSOM who is leading this differential diagnosis (DDx) research, said, “failures of diagnosis are a tremendous clinical problem,” and “failure to entertain the proper diagnosis”

constitutes a significant percentage of such errors.

“A failure to generate adequate and appropriate differentials is a likely root cause of diagnostic error—and such errors frequently put patients at risk,” according to a 2020 article by Leeds and his team. They cited estimates that “in the U.S. outpatient population alone, perhaps 12 million patients a year are exposed to errors in diagnosis, half of which result in measurable harm.”

Research shows that wrong or delayed diagnoses cause more harm to patients than any other kind of medical error, resulting in 40,000–80,000 deaths annually in U.S. hospitals. The Society to Improve Diagnosis in Medicine said improving

diagnosis could save \$100 billion per year in unneeded tests, wrong treatments, and malpractice lawsuits.

Honing diagnostic skills is a lifelong pursuit, but BSOM researchers have found the use of mental shortcuts can improve novice doctors’ ability to form differentials.

“There’s a school of thought that says the only way you get better at DDx is to do it a whole lot,” Leeds said. “We don’t believe that. We think we can figure out what experts are doing and make it teachable.”

BSOM researchers have developed a three-step model of DDx. First, doctors intuitively generate a list of possible diagnoses. Then they filter out implausible diagnoses and order the remaining diagnoses for likelihood and risk to patients.

“If you don’t get generation right, the rest of it falls apart,” Leeds said. “That’s the stumbling block for most students.”

The problem likely isn’t a lack of knowledge. “By the third year of medical school, the average student has acquired an impressive reserve of clinical knowledge,” BSOM researchers wrote.

“The problem is not knowledge,” Leeds said. “The problem is access to knowledge.”

The BSOM researchers found that third-year medical students made broader and better differentials when they jogged their memories with metamemory techniques, or MMTs.

The ongoing research began in 2018, when a full class of BSOM’s third-year family medicine clerkship students was evaluated over an academic year.

Researchers asked the 114 students to generate differentials for fictitious cases based on common clinical scenarios. They paired the eight cases so students generated differentials before and after receiving training in each of four MMTs.

“Students and educators often think of MMTs as gimmicks or ‘tricks,’ but such devices have been shown to enhance academic performance in a variety of settings,” the BSOM research noted.

The researchers wrote that the four MMTs under study were chosen “based on their broad applicability, apparent common usage in clinical settings, and the teaching experience of the authors, as well as on the relevant literature.”

**The four MMTs studied by researchers were:**

- **Mental CT Scan:** A visualization technique in which

students were asked to mentally “dissect” patients from front to back, asking “What lives here?” and “What can go wrong with it?”

- **Bundling:** A cue to remind the students that “diagnoses travel in packs.” That is, sometimes a diagnosis for a given scenario is associated with other diagnoses. “Once you get one,” Leeds said, “you get the others for free.”
- **Constellation:** A pattern recognition tool to generate differentials from various constellations of medical findings.
- **V.I.N.D.I.C.A.T.E.S.:** A mnemonic to remind students to consider various diagnoses by pathophysiology. It stands for Vascular, Inflammatory, Neoplastic, Degenerative, Idiopathic/Iatrogenic, Congenital, Autoimmune/Allergic, Trauma/Toxic, Endocrine/Electrolyte/Electrical, and Social/Psychiatric.

Students were limited to three minutes to generate differentials in each case. “It was very rapid-fire,” Leeds said.

Researchers determined differential sizes by the raw number and by those comporting with a list of medically plausible diagnoses.

The study showed that students using the Mental CT Scan generated a statistically significant increase in differentials over those who didn’t. There also appears to be a cumulative improvement when the other MMTs are used.

Benefits of the “weaker” MMTs may be statistically significant in a larger study, researchers said.

BSOM researchers are now working on a “big kahuna” theoretical model paper and Leeds is writing a book on the topic.

The MMT training has proven popular with students, who said the Mental CT Scan was particularly useful.

“I want them to walk out thinking, ‘I’m a better doc for this and they didn’t waste my time,’” Leeds said. —TOM BYERLEIN





# Research Spotlight

## Artificial intelligence could help medical students get better feedback

Studies have shown that doctors can be more effective when they ask better questions and let patients do more of the talking. But, too often, doctors fall back on the practice of educating and advising patients when the situation calls for better listening.

Researchers at BSOM are now using the latest in artificial intelligence technology—a computer application they call ReadMI—to provide better feedback to medical students and residents on their use of motivational interviewing (MI) when talking with patients. The researchers say their work “has the potential to transform MI training” and improve the quality of health care.

MI is patient-centered conversation in which physicians speak less and ask more open-ended questions designed to strengthen patients’ motivation and commitment to make healthy lifestyle changes. Physicians using MI guide patients toward taking charge of improving their health.

Paul J. Hershberger, Ph.D., a BSOM professor of family medicine, noted that the U.S. “spends more on health care, but we actually have poorer outcomes than most developed countries, particularly in chronic disease morbidity. That suggests we should pay more and better attention to patients’ responsibility in their health care.”

Motivational interviewing doesn’t preclude doctors from educating and advising patients, but it puts more emphasis on leading patients to express their health concerns and make plans for improvement.

In addition to open-ended questions, MI emphasizes the use of reflective statements designed to elicit a response, such as “You’re very concerned about the possibility of developing diabetes,” followed by a pause for a patient response. Another MI technique is asking patients to use a scale of 0–10 to rate importance, readiness, or confidence about change.

Hershberger said MI has been shown to be effective in motivating patients since its introduction in 1983, but “it’s never been widely implemented. Telling patients what to do seems easier and gets modeled in the clinical setting.”

MI training can be time-consuming, Hershberger explained, because it involves transcribing and evaluating interviews to quantify doctors’ use of MI skills.

That’s where ReadMI comes in. BSOM researchers, in partnership with the Wright State College of Engineering and Computer Science, developed the training tool to automate the process of transcribing and evaluating MI interviews.

ReadMI stands for Real-time Assessment of Dialogue in Motivational Interviewing.

ReadMI uses the low-cost, highly accurate Google Cloud Speech app to transcribe interviews, and analyze the transcripts to evaluate how well doctors are using the MI approach. ReadMI “produces a spectrum of metrics for MI skills evaluation, including the number of open- and closed-ended questions asked, provider versus patient conversation time, number of reflective statements, and use of a change ruler (the 0–10 scale)...eliminating the need for time-consuming reviews of recorded training sessions,” according to the scholars’ research.

Automating the transcription and some of the analysis of doctor-patient conversations greatly speeds the process and frees faculty to evaluate the spirit of the conversation, which can’t be graded by a machine, Hershberger said.

The initial BSOM research in 2019 used ReadMI to analyze 48 role play conversations between simulated patients and residents in family medicine and internal medicine. The simulated patients presented prepared scenarios to residents, including a patient requesting more opioid pain medication and a member of the clergy using marijuana to cope with stress.



The conversations were transcribed and analyzed by ReadMI. Five human MI training facilitators also read the transcripts and rated the physician utterances. Overall, there was moderate agreement of 33.3 percent between ReadMI and the human raters, but ReadMI was more than 90 percent accurate in producing transcripts, discerning open-ended and closed-ended questions, and isolating physician- and patient-speaking time. It was weaker in recognizing reflective statements.

“A significant, negative correlation was found between physician-speaking time and the number of open-ended questions asked,” according to the study. “That is, the more time a physician

spends talking, the fewer open-ended questions they ask.” That was also true of other MI metrics.

A forthcoming paper based on a randomized, controlled trial of 120 medical students will report that students asked significantly more open-ended questions if ReadMI was employed in interview feedback, Hershberger said.

Yong Pei, Ph.D., LexisNexis Ohio Eminent Scholar and professor of computer science at Wright State, helped to develop ReadMI. He said ReadMI was especially accurate in online interviews, which makes it a good fit for telehealth visits.

In the future, project leaders Hershberger, Pei, and Dean A. Bricker, M.D., a BSOM associate professor of internal medicine, hope to see ReadMI become even more automated, accurate, and user-friendly for faculty. They also hope for real-time analysis so doctors can see their MI metrics on screen during consultations.

BSOM introduces motivational interviewing during students’ first two years, and provides training in the family medicine, clerkship and in several residency programs. —TOM BYERLINE



# In Residence

## The benefits of an orthopaedic research residency program



**B**SOM is making a name for itself in orthopedics research, in part because of its research residency program.

BSOM is among fewer than 15 percent of medical schools in the United States to offer a research track in its orthopedics program. According to a 2019 article in the *Journal of Bone and Joint Surgery*, only 23 of 196 U.S. orthopedic residency programs include a research track.

The addition of the elective research residency program in 2008 has significantly boosted BSOM's orthopedic research production and consequently increased its national visibility, said

Andrew W. Froehle, Ph.D., a BSOM associate professor and the research director of the Orthopaedic Residency Program since 2016. Because of the program, BSOM is represented at more national and regional research meetings than it was in the past.

The program “just creates a culture of research being more central to residency” at BSOM, Froehle said.

Anil B. Krishnamurthy, M.D., director of the Orthopaedic Residency Program, said BSOM launched the research residencies in 2008 when a previous research fellowship was folded.

“One of our weaknesses was we were

not very strong in our research production,” Krishnamurthy said. The research residency program has done “a tremendous amount of good in terms of research productivity.”

The program added two orthopaedic research residents per year in addition to two categorical residents. The research residents take a year of protected research time after their intern year, for a six-year course instead of the customary five years.

These residencies are not particularly aimed at those who want to go on to academic careers.

“We don't look for people pursuing any

particular career path, so if research residents end up in academic positions, that's great. But if they go into general practice in a rural community, that's just as great in our eyes,” Froehle said.

“We want to train excellent surgeons who also have a clear understanding of

peer-reviewed articles, up from 52 percent prior to the research residency.

“The productivity of publication has shot up, and that's true of the research residents and the non-research residents,” Froehle said. “It benefits everyone.”

program began. Those results are not in, but Froehle said, “by and large, I think it's going to mirror what we've seen with the residents.”

A review of BSOM's scholarly activity in 2021 shows there were 19 publications, a book chapter, four national presentations, eight regional presentations, and five state and local presentations.

BSOM's research residents have undertaken a host of studies covering a gamut of topics related to the treatment of musculoskeletal injuries and diseases. Among the research: clinical case studies, injury modeling, whole-body motion analysis related to injury prevention, studies on clinical outcomes, and approaches to using hardware like screws and plates to repair bony injuries. They also have done research into resident education itself.

“Breadth is our strength—being able to do a wide variety of research,” Froehle said. —TOM BYERLEIN

*“The importance of research exposure and education during orthopaedic residency has been discussed at length over the past few decades.”*

evidence-based medicine via their research experiences. How they apply the skills and knowledge in their careers after they leave is up to them.”

According to the article in the *Journal of Bone and Joint Surgery*, “The importance of research exposure and education during orthopaedic residency has been discussed at length over the past few decades.” The Accreditation Council for Graduate Medical Education requires that orthopaedic residency programs incorporate research into their curricula. “However, the many challenges associated with completing meaningful research in a surgical residency have been well described, including limitations in time, experienced mentors, research infrastructure, and research funding,” the article said.

BSOM is tackling these challenges with its research residencies.

A recent review by BSOM researchers shows that 86 percent of all BSOM orthopaedic residents are now publishing

In addition, the program has led to broader participation in research by others in the BSOM community. Ten to 15 medical students per academic year participate in the research residents' work, giving them experience in research and enhancing their curricula vitae.

This experience in research gives participating BSOM students better chances of matching with an orthopaedic residency program in a highly competitive environment.

The program has been popular with residents, Froehle said. “People want it expanded to conduct more and larger studies.”

Although there are no plans to add research residency slots, BSOM's recent addition of faculty members—and plans to add more—will also mean greater diversity in research areas.

BSOM is currently studying whether faculty research activities have also increased since the research residency



# In Good Company

## Optimizing readiness and performance in extreme environments

Julianne Althoff, M.D., an Ohio native, has traveled the world throughout her medical career. She has served and lived in Japan, Spain, and over 13 other locations throughout the world. She has served as the senior flight surgeon for Marine One, the presidential helicopter squadron. Now, she has returned to Dayton to continue assisting in research and to oversee operations for the Naval Medical Research Unit Dayton (NAMRU-D).

Althoff serves in a leadership position for NAMRU-D, where her mission is to optimize the readiness, performance, and survivability of operational forces through environmental health effects, toxicology, and aerospace medical research and development. “We really focus on performance in extreme environments,” Althoff said.

NAMRU-D consists of two labs, the Environmental Health Effects Laboratory (EHEL) and the Naval Aerospace Medical Research Laboratory (NAMRL). EHEL efforts include evaluation of chemical, physical, and environmental stressors such as

toxic fume exposure, as well as evaluation of the combinations of stressors. NAMRL efforts include acceleration, spatial disorientation, hypoxia, fatigue, motion sickness, vision standards, and performance.

Within these areas, NAMRU-D works to ensure that safety policies and standards match with current research about exposure and workplace hazards. They also develop technology to ensure officer safety.

For example, NAMRU-D developed and tested goggles for the coast guard. These goggles will protect pilots from lasers fired at them in an airplane cockpit. “This was a real problem,” Althoff said. “Our lab was able to be part of the solution and provide the solution.”

Althoff has also worked to assist in fighting the ongoing COVID-19 pandemic. Before she was stationed in Dayton at Wright-Patterson Air Force Base, she was the chief medical officer for the Naval Medical Center in San Diego. Before the COVID-19 vaccine was available, Althoff used other preventative measures, such as masking, social distancing, hygiene, and avoiding large social gatherings, that were proven effective during the 1918 flu pandemic to protect her staff and colleagues.

Along with her colleagues, Althoff ensured that patients received the best possible care through quality assurance and patient safety initiatives. As the chief medical officer, Althoff oversaw coordinating treatment efforts and she worked hard to ensure that each office and branch provided the highest quality of service to their patients, along with keeping staff safe by utilizing more virtual appointments and avoiding in-person contact when possible.

Ever since she was young, Althoff wanted to be a doctor. She was inspired by her grandfather, who passed away during the flu pandemic in 1918.

She received her bachelor’s degree from Ohio Wesleyan

University before she graduated from the Boonshoft School of Medicine in 1995 and completed her flight surgeon training in 1997. She received her Master of Public Health degree from the Uniformed Services University in Bethesda, Maryland, and a Master of Arts degree in national security and strategic studies from the Naval War College in Newport, Rhode Island. In 2005, she completed a residency in general public health and preventative medicine at the Uniformed Services University.

She then served in Okinawa, Japan, where she created a biohazard response plan for the U.S. Pacific Command, which became the blueprint for the way the Department of Defense (DOD) responded to the H1N1 pandemic, also known as the Swine Flu, in 2009.

From 2016 to 2019, Althoff served as executive director of the Defense Health Board. She led the DOD’s only federal advisory committee on health. She assisted in developing two reports on pediatric health care and low-volume, high-risk surgical procedures. These reports provided hospitals with information that improved care opportunities. The committee was made up of civilian experts and specialists, who assisted the DOD to examine areas of interest in the world of health. Althoff said the expertise on the board was expansive. “It was amazing to be part of the committee,” Althoff said. “The caliber of the people on the board was shocking, it was a wonderful role for advising.”

Althoff said she is glad to be back in Dayton and is happy to be working with NAMRU-D. Her labs work with over 54 partners, including NASA, Wright State, and other educational institutions. “These partnerships are essential and highly valued aspects of successful research and development efforts,” she said. “We work with a lot of people who are graduates from Wright State. It’s been fantastic.”

Althoff said she has enjoyed reconnecting with the BSOM and the Wright State alumni society. She enjoys seeing how far the medical school has come and is proud to see the direction the school is taking. —MICAH KARR



Julianne Althoff, M.D.



# Student researchers find the best way to reach refugees and immigrants with COVID knowledge



The COVID-19 pandemic underscored the difficulties in getting information about the virus, its vaccines, and preventative measures into the hands of global refugees and others in America with limited English language proficiency.

But research being conducted by BSOM students is probing refugees’ and immigrants’ knowledge and attitudes toward the pandemic and how to best reach them with potentially life-saving information.

Among their findings: Secondary English speakers, or SES, were much more likely than other local residents in the survey to trust COVID-19 information provided by the U.S. government and to believe the government has ensured their safety during the pandemic.

“The SES were more likely to have positive attitudes about the COVID-19 vaccine and exhibit disease prevention measures,” such as mask wearing, said Estelle Viaud-Murat, who is leading the research team along with fellow BSOM student Monica George.

The researchers are particularly interested in breaking down language barriers in communicating health information. The team also includes BSOM students Natalie Castillo, Colette Beard, and Josef Rivera.

English is not the first language for about 22 percent of the U.S. population, and studies have shown that people with limited English proficiency suffer more medical errors in the U.S.

The COVID-19 pandemic unleashed a flood of information—news reports, social media posts, billboards, pamphlets, and newsletters—but it was overwhelmingly in English, the BSOM study pointed out.

“So much of our information was online, including translated information,” Viaud-Murat said. But BSOM’s research shows that secondary English speakers prefer traditional printed pamphlets from trusted sources for their information, perhaps because many don’t have easy access to the internet.

“This initial communication surge illuminated the gaps in our health care system for those who are secondary English speakers,” according to a BSOM research paper. “Although numerous state (health) departments gradually included Spanish and American Sign Language, the global population had to continue to find resources in a language that they could understand.” SES patients had to find translated information on their own, “opening the door to misinformation, and exacerbating the disparate care for already

vulnerable populations.”

The BSOM research paper reported on the results of a survey of 144 adult patients of Five Rivers Health Center in Dayton, conducted between February and April 2021.

While most of the participants were primary English speakers, 23 percent identified as secondary English speakers, often refugees, hailing from 15 different countries. The survey was available in seven languages. The participants were compensated with a gift card.

More than 90 percent of both primary and secondary English speakers felt that COVID-19 is a serious problem and more than 80 percent felt that contracting COVID-19 personally would cause a serious illness. Two-thirds of both groups wanted to get the vaccine when it was available.

But there were significant differences between the two groups:

- Secondary English speakers were more likely to trust pandemic information provided by the U.S. government and by their health care providers. George theorizes their faith in government is greater because they’re accustomed to working with government entities and following government rules

during the resettlement process.

- The SES participants were significantly more likely to feel that social distancing could help reduce the spread of the COVID-19 virus and feel that everyone should be vaccinated.
- Global patients were significantly less likely to believe that their cultural needs had been met throughout the pandemic. They also were more likely to fear the financial impact of contracting COVID-19.

Additionally, secondary English speakers were more likely than primary English speakers to believe they were well-informed about COVID-19, yet the study found they were less successful in identifying possible symptoms of the virus. Of 15 possible symptoms, PES participants could identify an average of 9.21, compared with only 6.39 for secondary English speakers, the study found. Fewer than half of SES participants knew that loss of taste or smell is a COVID-19 symptom, compared with almost 80 percent of the PES participants.

Television and radio reports were the main sources of information for both groups, but these sources were the least

trusted. TV and radio were trusted by only 30 percent of SES and 18 percent of PES participants.

Health care professionals were trusted by 82.88 percent of PES patients and more than three quarters of SES patients. State government agencies were trusted by almost half of SES patients, and 38.74 percent of PES patients.

Where primary English speakers favored internet postings and email handouts from trusted sources for their pandemic information, the refugees and other immigrants preferred translated mailed handouts, followed by phone calls in their primary language.

As a result, the researchers developed a brochure covering precautions against COVID-19, symptoms of the virus, and what patients should do if they contract it. They also created a manual for health professionals covering the brochure material in greater depth.

In a second phase of the research, now under way, SES patients at Five Rivers are being given the translated brochure at a visit. Some are also being given verbal instructions about the virus derived from the training manual, Viaud-Murat said. Participants then will take a survey to determine how the

brochure and verbal instructions may have changed their knowledge and attitudes. Results of the Phase One survey will be used as the baseline.

These new surveys are designed to gauge the effectiveness of the brochure and verbal instructions in reaching SES patients with COVID-19 information.

“Once we know what works and doesn’t work, we want to expand the research to other cities in the United States and Canada,” Viaud-Murat said.

George said the information can be of continued usefulness in the COVID-19 pandemic, and it also could help to disseminate information to refugees in any future health emergency.

“The goal is to have the framework for next time there’s a need to vaccinate, mask, and implement other health protection measures,” she said.—TOM BYERLEIN



# Fond Farewell

## Paul Koles, M.D.

Paul Koles, M.D., chair and associate professor with the BSOM Department of Pathology and associate professor with the BSOM Department of Surgery, retired in June 2021.

Koles began his career at BSOM in 1986 as a clinical assistant professor with the Department of Pathology, and the pathology residency program. During the late 1980s through the mid-1990s, he served as a clinical assistant professor with dermatology and the pathology residency program associate director. In 2001, Koles became an assistant professor with surgery and director of BSOM pathology education. In 2009, he was promoted to chair of pathology and associate professor of surgery.

Koles was one of a trio of BSOM pathology faculty who played a critical role in the development of the WrightCurriculum, the learning environment adopted by BSOM in 2017. WrightCurriculum was built on three principles—self-directed learning, evidence-based teaching and learning, and an evolving curriculum, based on what best promotes collaborative learning between students and faculty.

Highly regarded by BSOM students, Koles was honored 17 times with the Teaching Excellence in Pre-Clinical Medical Education award between 2002 and 2021. The BSOM Student National Medical Association awarded Koles the Teaching Excellence Award six times between 2006 and 2019, and BSOM students selected him to receive the Humanism in Medicine Award in 2004.

Koles believes expert knowledge, open communication, and a demonstratable commitment to student development leads to being an effective educator. “It is

important for educators to allow their personality and passion show, for students to not only see how the instructor is thinking, but how he or she is feeling, becoming more human and approachable,” said Koles.

Throughout his years at BSOM, Koles not only educated students but also provided mentorship and academic coaching, including career planning and USMLE (United States Medical Licensing Examination) preparation. “A commitment to students’ development is necessary to establish coaching and mentoring relationships,” said Koles, whose mentorship contributed to 15 students entering a pathology residency between 2013 and 2021.

Many of Koles’ most meaningful relationships with students unfolded as they achieved success while working with him. Observing a student’s courage, determination, and dedication to overcome adversity, both personal and professional, to reach their goals was truly inspiring.

When asked about a memorable moment from his time at BSOM, Koles shared attending graduation ceremonies and observing students and faculty openly express their appreciation for one another. He also fondly recalled co-facilitating faculty development sessions with Dean Parmelee, M.D., BSOM professor of psychiatry and pediatrics, and director of educational scholarship and program development. “He was such a master of relationship-building and communication. I thoroughly enjoyed helping my colleagues.”

The day after Koles retired, he started PGK Pathology Services, LLC. In this new role, he provides postmortem examinations for families who have lost a loved one, helping them find closure



Paul Koles, M.D.

regarding cause of death, and assessment of risks for inheritable or familial diseases. Occasionally, he has been called upon to provide expert testimony for depositions or in the courtroom.

Koles has also resumed writing. He wrote poetry and short stories before becoming a physician. His current works of fiction focus on spiritual themes.

Koles enjoys spending time with his wife Carol, sons Stephen and Aaron, and daughter-in-law Naomi. He also keeps busy being a grandpa to Cameron. Koles said, “Cameron is 10 years old and always has great ideas about how to engage grandpa in multiple activities, some of which make me feel like a kid again.” —LISA COFFEY

## Mary McCarthy, M.D.

Mary McCarthy, M.D., FACS, professor of surgery and former chair of the Department of Surgery at BSOM, retired in December 2021. Additionally, McCarthy was a member of the surgical team with Wright State Physicians, from which she also retired.

Beyond caring for many patients during her 31 years with BSOM, she transformed medical students into surgeons and elevated the trauma center at Premier Health’s Miami Valley Hospital.

In 1991, McCarthy was hired as an associate professor of surgery with BSOM. In 1994 she was promoted to full

professor, and in 2010 appointed the Elizabeth Berry Gray Chair of Surgery, a role she held until 2018.

McCarthy also served in faculty roles with Wright State’s nursing program from 1993 to 1998, and the university’s engineering program from 2012 to 2017.

In 1991, along with beginning her new role at BSOM, McCarthy was selected as director of the trauma center at Miami Valley Hospital. Just 18 short months later, while under McCarthy’s direction, the trauma center was awarded Level 1 status by the American College of Surgeons, becoming the first trauma center in the Dayton region to achieve this distinction.

Earning and maintaining Level 1 status helped patients by attracting top-notch trauma surgeons to Dayton, and helped students by attracting accomplished clinical faculty to BSOM.

When asked to reflect on memorable moments at BSOM, McCarthy said, “The class of 2017 graduation, when 22 students went into surgery.” She also shared her gratitude for the opportunity to train generations of physicians and see them take their knowledge onto battlefields, and respond to national emergencies. McCarthy added, “It is very satisfying to teach young physicians and have them carry that knowledge all over the world.”

McCarthy was a member of nearly 25 national professional organizations, serving in many leadership roles, including vice president the American Association for the Surgery of Trauma and second vice president of the American College of Surgeons. “These are the two elite organizations of trauma and surgery in the United States, which demonstrates how well-respected she is,

locally and nationally,” said Akpofure Peter Ekeh, M.D., BSOM professor of surgery, trauma program medical director at Premier Health’s Miami Valley Hospital, and trauma surgeon with Wright State Physicians.

Not only did McCarthy contribute to the education of BSOM students, she also influenced learners at over 50 universities and organizations across the United States and worldwide. Clinical education areas included paramedic, emergency medical technician, nursing, and allied health. She also participated in surgical grand rounds. McCarthy was chosen to deliver the keynote address for the West African College of Surgeons Presidential Plenary Session and TEAM Training in Banjul, Gambia.

The list of awards McCarthy has earned throughout her career is extensive, and reflects her excellence in patient care and teaching. Honors include Best Doctors in America, America’s Top Surgeon, Patients’ First Award, Who’s Who Among America’s Teachers, and “Leg of the Stool” award for excellence from the Wright State faculty.

McCarthy donated her time to dozens of organizations within health care, including BSOM, Miami Valley Hospital, the Veterans Affairs Medical Center, and Wright State Physicians. She provided professional service on a state, regional, and national level, including a study on major trauma outcomes with the American College of Surgeons. She also served as honorary commander for Wright-Patterson Air Force Base in 2011–12.

McCarthy contributed her expertise to over 100 publications, abstracts, and book reviews. She shared her knowledge with the local Dayton media, and nationally with the *Dallas Times Herald*,



Mary McCarthy, M.D., FACS

and *Los Angeles Times Syndicate*.

McCarthy completed her surgery internship and residency at the University of Texas Southwestern Medical School & Affiliated Hospitals in Dallas, and received her medical degree from Indiana University School of Medicine. She earned her Bachelor of Science in Biology from Stanford University.

As she cleaned out her office, McCarthy discovered letters and photos from former patients sharing their gratitude and how they would not have made it if they had not been in a Level 1 trauma center. McCarthy is extremely proud of the collaboration between Premier Health and BSOM in developing the trauma program. She is also quick to recognize the support she received from colleagues and hospital officials in building the program.

McCarthy hopes to see continued support of the trauma program at BSOM, and a focus on patient care, education, research, and injury prevention. She funded the Mary C. McCarthy, M.D., FACS, Trauma Endowed Professorship at BSOM, creating a position that will emphasize these areas.

In retirement, McCarthy is looking forward to spending time with her husband, children, and grandchildren. She will no doubt continue to mentor young physicians, including daughter Alison Bales, M.D., former WNBA star who graduated from BSOM in 2017. Bales is currently a fifth-year surgical resident at Indiana University.

*continued on next page*



Mark Your Calendar

Convocation

July 9, 2022

1 p.m. | Wight State University Nutter Center

WELL Weekend

February 23–26, 2023

Silverado Resort and Spa—Napa, CA

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Her final day on call, hundreds of colleagues surprised McCarthy with a “clap out” as she left. “I cried, and I never cry,” McCarthy said.

“Saving patients’ lives and teaching new surgeons were the most rewarding aspects of my job,” added McCarthy.

If you are interested in making a contribution to the Mary C. McCarthy, M.D., FACS, Trauma Endowed Professorship, contact Angela Clements, assistant vice president for advancement, at [angela.clements@wright.edu](mailto:angela.clements@wright.edu), scan the qr code below, or go to <https://wright.edu/McCarthy-professorship> to give online. —LISA COFFEY

Donate to the  
Mary C. McCarthy  
M.D., FACS,  
Trauma Endowed  
Professorship Fund:



On The Move



Ngozi F. Anachebe,  
Pharm.D., M.D.

Ngozi F. Anachebe, Pharm.D., M.D., FACOG, was appointed to the position of vice dean for educational affairs last October. Her new role will bring the offices of student affairs, admissions, and medical education together to encompass the BSOM medical student educational experience.

Anachebe comes to the BSOM from Morehouse School of Medicine in Atlanta, where she served as a faculty member, as well as senior associate dean for admissions and student affairs.

Her academic interests include predicting outcomes in medical school, mentoring underrepresented medical students, and studying health disparities in reproductive outcomes. She is currently a co-investigator on a Health Research Services Administration Health Careers Opportunity Program grant.

Anachebe is a cum laude graduate of the Mercer University College of Pharmacy, where she received her Pharm.D. and a graduate of the Morehouse School of Medicine, where she received her M.D. She completed an internship and residency in obstetrics/gynecology at Morehouse School of Medicine/Grady Memorial Hospital in Atlanta, where she served as chief resident.

Once she completed her internship, Anachebe served in several faculty roles at Morehouse. She served as OB/GYN clerkship director and assistant and associate dean roles in both admissions and student affairs and undergraduate education. —MICAH KARR

David Dhanraj,  
M.D., M.B.A., C.P.E.

David Dhanraj, M.D., M.B.A., C.P.E., was named the chair and associate professor of the Department of Obstetrics and Gynecology and associate dean for clinical affairs. He comes to the university from TriHealth in Cincinnati, where he served as the director of operations for the Faculty Medical Centers and helped lead infant mortality reduction efforts.

During his time at TriHealth, Dhanraj also worked as the director of the academic obstetrics and gynecology generalist division of the specialty’s residency program.

Dhanraj’s current position in the BSOM was not his first. Between 2008 and 2011, he was an assistant professor and served as the director of minimally invasive gynecologic surgery. He also saw patients as a provider at Wright State Physicians.



As Dhanraj moves ahead, he is looking forward to collaborating with community partners and health experts at Wright State to help improve perinatal outcomes in Dayton.

“I love working with our OB/GYN residents and faculty in innovating and executing improvements in patient care and education,” Dhanraj said. “I also enjoy connecting multidisciplinary groups in achieving common goals.”

Dhanraj earned his M.D. from Indiana University School of Medicine. He completed his residency at Good Samaritan Hospital in Cincinnati. He holds an M.B.A. from Wright State University. —MICAH KARR



# Alumni Notes



We are proud of our alumni and the graduates of our residency programs and want to spread the word about your achievements. If you have professional news or personal updates to share—or simply want to stay in touch—please email the Office of Advancement at [som\\_adv@wright.edu](mailto:som_adv@wright.edu) or call 937-245-7634.

**'81 Frank Cebul, M.D.**, Wooster, OH, retired in the fall of 2021 from a successful career as a family physician.

**'88 Gary LeRoy, M.D.**, received the Torchlight Leadership Award from the Ohio Academy of Family Physicians for his efforts in advocating for patients and advancing the field of family medicine. He was also honored by the Wright State University Alumni Association as the 2021 Alumnus of the Year.

**'95 Teresa Zyrd, M.D.**, was installed in August 2021 as president of the Ohio Academy of Family Physicians. Zyrd is vice president of academic affairs and research with Premier Health, a family medicine preceptor with Wright State University Boonshoft School of Medicine, chief medical consultant for Dayton Public Schools, and one of the assistant team physicians with University of Dayton athletics.

**'99 Robin Rinehart, M.D.**, is a physician in geriatrics with Wright State Physicians, Fairborn, OH,

and assistant professor in the Department of Geriatrics with Wright State University Boonshoft School of Medicine.

**'00 Steven Burdette, M.D., FIDSA, FACP**, internal medicine, was voted a *Dayton Magazine* "Dayton's Best Docs" in 2021 and 2022.

**'02 Andre T. Harris, M.D.**, received the Distinguished Alumni Achievement award for 2021 from the Wright State University Alumni Association. Harris is president of Gem City Medical Dental Pharmaceutical Society in Dayton, and chief medical officer of Premier Health's Atrium Medical Center in Middletown, OH. **Melissa Roelle, M.D., FACS**, surgery, was voted a *Dayton Magazine* "Dayton's Best Docs" in 2021 and 2022. Roelle's photo was featured on the cover of the spring 2022 issue.

**'04 Joseph Seaman, M.D.**, has been named associate chief medical officer for Sarasota Memorial Hospital, Sarasota (FL) campus. Seaman is board certified in internal medicine, pulmonary medicine, critical care, and

interventional pulmonology.

**'07 \*Mark E. Blair, M.D.**, general psychiatry, is the founder and CEO of Optimum TMS in Columbus, OH. Transcranial magnetic stimulation (TMS) treatment involves stimulating nerve cells in the brain to help improve symptoms of depression. Blair is experienced working with a wide array of mental health conditions including depression, OCD, schizophrenia, bipolar disorder, PTSD, and various anxiety disorders.

**'09 Katherine Wehri Takayasu, M.D., M.P.H.**, published the cookbook *Plants First – A Physician's Guide to Wellness Through a Plant-Forward Diet*. Dr. Katie, as she prefers to go by, combines traditional Western medicine with acupuncture, mind-body medicine, and nutrition to help patients holistically.

**'10 Erik Balster, M.P.H.**, psychiatry, with members of the Boonshoft School of Medicine Department of Psychiatry, presented "Transgender-Affirming Care: What Every Psychiatrist Should Know," selected by

the American Psychiatric Association as a Course of the Month. **Kelly Miller, M.D., Ph.D.**, was recognized as a Health Care Hero by the *Dayton Business Journal*. Miller is a medical oncologist with Dayton Physicians Network.

**'13 Remah Ali, M.S., Ph.D.**, biochemistry and molecular biology, joined the faculty at St. John Fischer College Wegmans School of Pharmacy in Rochester, NY. Ali is a metastatic breast cancer researcher. **Michelle Keeley, M.D.**, OB/GYN, has joined the OB/GYN team with Ascension Genesys Hospital in Grand Blanc, MI. Keeley specializes in menopause care and minimally invasive and robotic surgery.

**'14 Maria Carratola, M.D.**, otolaryngology, has recently joined Ochsner Health in Baton Rouge, LA. She also sees patients at Ochsner Medical Complex, The Grove, and Ochsner Health Center in Prairieville, LA. Her expertise is in pediatric airway reconstruction. **Elizabeth Cordial, M.D.**, has joined Adena Family Medicine in Circleville, OH. Cordial specializes in family medicine and primary care. **John Corker, M.D., FACEP**, was recognized by the Emergency Medicine Residents' Association as a 25 Under 45 honoree.

**'15 Brent Aebi, M.D.**, ophthalmology, is now with East Tennessee State University Health, Johnson City, TN. He specializes in conditions including glaucoma, diabetic eye disease, and cataracts, and is a fellow of the American Academy of Ophthalmology. Aebi lives in northeast TN with his wife and two children. **Cody Green, M.D.**, orthopedics, has joined Orlando Health Jewett Orthopedic Institute in Orlando, FL. Green is an

orthopedic surgeon who specializes in total joint replacement. **Betty Cheney Kelly, M.D.**, pediatrics, was published in *Florida Today*. Her article featured injury prevention in the home and office in recognition of National Safety Month. Kelly is a pediatrician in Brevard, FL. **Brett Kockentiet, M.D., FAAD**, was recognized by Continental Who's Who as a Lifetime Achiever in the field of dermatology. Kockentiet is a dermatologist with Affiliated Dermatology and Cosmetic Surgery Center, Inc., in Dublin, OH. **Andrew Martin, M.D.**, surgery, has joined Northwest Health in Knox, IN. Martin is a bariatric surgeon, who also treats colon disease, performs hernia repair, and gallbladder, thyroid, parathyroid, and breast surgery.

**'16 Spencer Hill, M.D.**, urology, has joined Dayton Physicians Network in Dayton, OH. His specialties include kidney and prostate care. **Matt Knapke, M.D.**, family medicine, is with Central Ohio Primary Care near Columbus, OH. **Aaron Palmer, M.D.**, surgery, is in his fifth year of a seven-year neurosurgery residency at Northwestern Medicine in Chicago. **Jasmine Scott-Hawkins, M.D., M.P.H.**, completed her adult psychiatry residency, and child and adolescent psychiatry fellowship training with a diverse patient population. Scott-Hawkins currently resides in Los Angeles, CA.

**'17 \*Nita Bhatt, M.D., Ph.D.**, psychiatry, has been selected to serve for one term as Secretary for Ohio's Psychiatric Physician Association (OPPA). **\*Chris Wild, M.D.**, orthopedic surgery, presented to the Boonshoft School of Medicine Department of Orthopaedics the flag that flew in Afghanistan in their honor. The flag thanked attendings for his training. He

also gave a lecture on the trauma cases he performed during his deployment. Wild is currently working in Dayton at the Wright-Patterson Air Force Base Medical Center.

**'18 \*Kimberly DeLapp, M.D.**, OB/GYN, has joined Edward Medical Group (IL) as an obstetrician and gynecologist.

**'20 Isaiah Cochran, M.D.**, family medicine, led a health advocacy session during the American Academy of Family Physicians' (AAFP) National Conference of Family Medicine Residents and Medical Students in July of 2021. He is also the resident member of the AAFP Commission on Federal and State Policy. Cochran serves on the American Medical Student Association Foundation Board of Directors. His future plans include running for political office so he can more directly affect health care policy and advocacy. He is currently in family medicine residency in FL. **Rinki Goswami, M.D., M.Sc.**, has started the nonprofit Bridging Medical Gaps Collaboration, which addresses health equity. She is currently completing an internal medicine residency at the University of Cincinnati.

**'21 \*Chioma Eze, M.D., M.P.H.**, family medicine, is doing mission outreach in her home country of Nigeria, along with precepting residents at the Global Health Refugee Clinic at Five Rivers Family Health in Dayton, Ohio.

\*Residency graduate.





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