### Boonshoft School of Medicine WRIGHT STATE UNIVERSITY

# **Translational Research:** Shortening the path from bench to bedside

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Surgery by remote

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Paul Koles: Using all his gifts

**Michael Barratt's** space walk

### Issues and Insights: The Dean's Perspective

#### **Collaboration and community**

Of all the aspects of academic medicine that make my job so rewarding, the opportunity to work with so many dedicated professionals who excel in their diverse fields has to be one of the most gratifying.

Some of our faculty are caring practitioners who devote their days to making life better for patients and their families. Some are outstanding educators who possess a gift for helping students master the science of medicine and the art of healing. Still others are brilliant scientists whose work expands and refines our understanding of human life in all of its infinite complexity.

And, as you will discover in this issue's centerpiece feature on translational research, many of our faculty fulfill all three of these roles at once.

Also in these pages, we will introduce you to many other exceptional faculty, students, and alumni who are making a difference in the world and making their mark in the field of medicine. Like me, I hope you will find their stories interesting, informative, and even inspiring. From students breaking new ground over the radio waves to an alumnus leaving the ground far behind for a historic voyage into space, the individuals featured here are all exemplary in their own ways.

These stories highlight the importance of both personal initiative and productive collaboration. We are strongly committed to fostering both within the medical school, and I am thrilled to bring you such compelling evidence that our efforts are yielding results. Enjoy!

Toward Part, M.D.

Howard M. Part, M.D. Dean



### What's Inside

# Vital Signs

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Surgery by remote The newest member of the surgical team has four arms and can see through skin and tissue.



Translational research Translational research seeks to break down walls and accelerate the transition from "bench to bedside."



Paul Koles: Using all his gifts The preclinical years were just basically opening up a fire hydrant of information for us to swallow.



Susan Williams: Life on a platter No, you're not in your 20s. You're in your 40s. But this is where the payoff is going to be as you move forward.

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### **Cuba: Land of contrasts**

Barriers of language, culture, and politics can easily divide people, but physicians worldwide often face similar challenges and share a commitment to finding new and better ways to confront them. Michael Markus, M.D., assistant professor of medicine, and Ashley Fernandes, M.D., Ph.D., assistant professor of pediatrics and community health, had an opportunity to appreciate this conundrum firsthand during an international conference in Cuba in late 2008.

<sup>44</sup> The people were fairly vocal about being unhappy, but you were also aware that they were careful about who they were vocal around.<sup>77</sup>

> The conference, entitled "Medical Education for the 21st Century: Teaching for Health Care Equity," took place in Havana from November 30 through December 3 and brought together nearly 350 participants from more than 25 countries on six continents.

"It was great to exchange ideas with people from around the world about how to teach," Fernandes said.

He delivered a presentation on the first-year Social and Ethical Issues in Medicine course, which emphasizes interactive, experiential, and small group activities. Markus presented two papers, one on an online tool that allows students to ask questions and suggest changes anonymously, and another describing an online library of virtual patient case studies.

All three presentations generated strong interest at the conference and reinforced Markus and Fernandes' impression that the medical school is implementing some innovations that deserve notice.

#### Glimpses—and whispers of a different world

In addition to learning from their international colleagues, both physicians had a chance to visit sites around the city.

"I took advantage of every break in the conference," Fernandes said. "I was out there on the streets, seeing Havana, and it was an amazing experience."

Both were moved by the stark contrasts on display, between the island's beauty and poverty, and between the hardships and restrictions imposed by the government and the resilience and optimism of the Cuban people. "The buildings in Havana are beautiful," Fernandes said, "but there's no money to repair them, so they're all basically falling apart. You have this 17th-century, 16thcentury Spanish colonial architecture that's held together with tin and bits of wood."

"Everything is broken," Markus said. "Everything needs painted, repaired... Poverty is really rampant."

"I saw rationing lines that went around the block, like we had in the Great Depression," Fernandes added. However, people would eagerly chat with him "in the cabs, in the marketplace, on the street. They would come up to me. They were just so friendly. They have hope."

"The people were fairly vocal about being unhappy" with the government, Markus agreed, "but you were also aware that they were careful about who they were vocal around."

At an outdoor artisan fair, Markus said, a Cuban man told them, "What do I care if they put me in jail, because the island is a



prison. I can't leave. I can't go anywhere. Somebody tells me what kind of work I'm going to do, or if I'm going to be able to work. And somebody tells me where to live."

While many people felt comfortable voicing critical opinions casually, Fernandes said, in terms of official communication, "There was a lot of propaganda, even within the medical conference. Cuban participants almost always had some slide with Fidel Castro's picture on it. Or public health students presenting would throw in a line like, "This would not be possible were it not for the glorious leader Fidel.""

### Struggle and success in an imperfect system

As for their direct counterparts, Markus said, most seemed torn between praising the Cuban health care system and admitting its shortcomings.

"I think they can have a great deal of pride. There are medical successes there," he said, including the availability of free health care for the entire population.

On the other hand, universal access to care doesn't imply that the care is high-quality or equitable. Markus was appalled by the conditions in some of the local clinics, and the limited scope of available care surprised him. For example, one "pharmacy" he was shown consisted of a single, small cabinet.

"It was like a '40s or '50s candy store cabinet," he said, "and there were about 10 drugs, and three or four bottles of each. But they're free."

Fernandes recalled one conversation in particular, when a successful Cuban physician in a more modern care center told his tour group, "The reason the Cuban health system is as good as it is, is because the American health system is as good as it is." The fact that American texts, medical techniques, and research often reach Cuba is hardly a state secret. Even so, the physician's fellow Cubans, including an official from the health ministry who accompanied conference participants on all scheduled tours, were visibly startled by his candor.

"I know you're all shocked," the physician said, "but if something is good, let's just acknowledge it as being good. That's the only way we learn from each other."

"I was struck by that comment," Fernandes said. "He was willing to say that even though America causes his country hardship—that we do a lot of good things (for Cuba), and they can learn from that."

Fernandes tried to adopt a similar attitude while visiting a Cuban hospital and health clinics, and while attending presentations on medical education practices from around the world. He advocates for open-mindedness when considering ways to improve health care in the United States.

"We need to look at systems like Cuba's realistically, without idealizing" or condemning them, he said. "Let's be honest about what they're doing and the way they do it, but we can still look at the ideas and ask, 'Would this work?' Keep that in the dialogue." Outside of the conference, Fernandes and Markus had the opportunity to tour parts of Havana, converse with residents, and take photos (shown here) in neighborhoods where crumbling colonial architecture mingles with Soviet-style industrial construction.



### **Snapshots**

### Injury Prevention Center recognized for community outreach



Many IPC programs focus on reaching area teens and young adults with messages about safe driving, the risks of drug and alcohol abuse, and violence prevention.

#### As a trauma surgeon, Akpofure Peter Ekeh, M.D., M.P.H., FACS, associate professor of surgery,

applies his skills and expertise to save lives, repair damage, and help patients recover from serious injury. His most effective work, however, may be on behalf of people who never need his services.

In his role as director of the Injury Prevention Center of Greater Dayton (IPC), Ekeh oversees a variety of community-based programs designed to reduce preventable injury and death.

The IPC was founded in 1995 by the Greater Dayton Area Hospital Association and is now a joint project of the Department of Surgery and the Miami Valley Hospital Level I Trauma Program.

The center's longest-running program, Drive ALIVE is a four-week course for teens convicted of moving violations. Follow-up studies have shown that participants are 50 percent less likely to commit another driving-related offense within six months.

The IPC also conducts alcohol education fairs at local schools to teach teens about the risks of underage drinking, and it participates in anti-violence programs for at-risk youth through schools and the juvenile court system. In addition, the Operation Street Smart program teaches parents, teachers, and others who work with teens to recognize street drugs and signs of their use.

In 2008, the *Dayton Business Journal* recognized the center with its annual Health Care Heroes Award for Community Outreach.

Shaun Hamilton, B.S., CHES, manager of the IPC and a student in the medical school's Master of Public Health program, was gratified by the recognition. He attributes much of the center's success to careful, ongoing data analysis, including a review of records and statistics from the trauma center, the court system, and other regional and national sources. The data might reveal a spike in motor vehicle accidents, for example, or a high percentage of offenses involving substance abuse.

"At that point we develop programs and initiatives to see reductions in that area," Hamilton said.

The statistics can be daunting, indicating complex or widespread issues that may be difficult to address, but Hamilton embraces the challenge.

"We can't hide from the data," he said. "We've got to take it on."

### An old idea for a new era of space exploration

For Paul Webb, M.D., clinical professor of aerospace medicine, the future has finally caught up to the past. The dawn of an exciting new era in space exploration—with NASA planning missions to the moon and Mars, and international and private-sector space programs flourishing—means the time may be right for a revolutionary concept he first proposed in the 1960s.

The Elastic Counter Pressure Suit (ECPS) Webb developed provides an alternative to the bulky, awkward, and expensive spacesuits astronauts wear today. Rather than surrounding the body with a fully pressurized "gas bag," the ECPS uses a high-tech fabric to create a skintight bodysuit that is lighter, more flexible, and more comfortable.

In addition to oxygen, pressure and temperature regulation are crucial to ensure survival in the vacuum of space. Traditional suits accomplish this with a whole-body enclosure full of oxygen and elaborate cooling systems. In contrast, the form-fitting fabric of the ECPS would prevent blood pooling and gas buildup while allowing sweat to wick away and evaporate, cooling the body naturally.

The inspiration for the idea came to Webb in the mid-1960s, when he considered ways to improve on the partial-pressure suits worn by highaltitude military pilots. The suits, which were tightened imperfectly by rows of tape, often enabled pilots to survive long enough to reach lower altitude in an emergency, but they could cause fainting within a matter of minutes. Webb wondered if an elastic fabric might provide more uniform pressure and support normal body functions longer.



Webb's site (elasticspacesuit.com) provides detailed information on the project's history and next steps, as well as photos and video from testing of early prototypes.

"I made a prototype," Webb said, "and in fact, it worked wonderfully well. All the problems were immediately solved."

Despite elaborate testing, including sessions in an altitude chamber, Webb wasn't able to convince NASA to shift gears and invest in further development of the concept. Now, though, a number of factors may make the ECPS a more appealing option.

"Textile technology has changed enormously in 40 years," Webb said. New materials and manufacturing processes enable the rapid, relatively inexpensive creation of suits that are incredibly strong and supple, easy to put on, and custom-tailored to each wearer.

Perhaps more importantly, current full-pressure suits simply aren't well-suited to the demands of extended activity on the lunar or Martian surface.

With the ECPS, in contrast, "You have good arm reach. You have good dexterity," Webb said. "Think about run, hop, skip, scaling a cliff, crawling into a small cave." All are perfectly feasible with an elastic suit.

The ECPS provides safety benefits as well, because a tear or puncture would no longer mean a catastrophic loss of oxygen. In addition, the suit is lighter and less expensive than current models. Webb projects that each ECPS, including oxygen tank and helmet, will weigh 85 pounds and cost around \$50,000, versus more than 300 pounds and nearly \$1 million for a full-pressure suit.

Webb has assembled a team, including physiologists and a textile expert, and is seeking funding to create and test a new prototype, which he believes could be ready in as little as two years.

To learn more and see videos about the project, visit elasticspacesuit.com. VS

### **Snapshots**

### Research symposium explores cutting-edge medical science "beyond the genome"

The science of proteomics is so new there wasn't even a word for it until 1994, when a grad student in Australia coined it for his Ph.D. thesis on rapidly identifying protein.

He used the word, a combination of "protein" and "genomics," at a scientific conference in Italy, and it stuck. Today, proteomics—the study of proteins and their production, function, and interaction is an emerging field of study that is having a major impact on medical research.

Proteomics is the next big step in medical research. Some of us believe it's the ultimate gateway to understanding the cause, diagnosis, and treatment of disease.

> To understand biological processes, scientists need to understand how proteins function. The sequencing of the estimated 35,000 genes in the human genome was only the beginning. Each of those genes can code for at least 10 times as many proteins, and in extreme cases a single gene can code for more than 1,000. In addition, protein activity affects an organism directly, whereas genes have an impact only through the proteins they encode.

"Studying all the proteins in a cell and how they interact and function in the body tells us much more than simply looking at the genome," said David Cool, Ph.D., associate professor of pharmacology and toxicology. "Proteomics is the next big step in medical research," Cool said. "Some of us believe it's the ultimate gateway to understanding the cause, diagnosis, and treatment of disease."

Last fall more than 80 scientists, researchers, and students from across the nation came to Wright State for a research symposium in this promising new field hosted by the Department of Pharmacology and Toxicology. The "Proteomics in Modern Medicine" symposium featured keynote speaker and Earl Morris Endowed Lecturer, Richard Caprioli, Ph.D., who is the Stanley Cohen Professor of Biochemistry and director of the Mass Spectrometry Research Center at Vanderbilt University. Caprioli is an internationally recognized, award-winning researcher whose groundbreaking work has greatly advanced the field of proteomics.

"Dr. Caprioli has developed, even beyond my wildest dreams, the ability to take tissue sections and determine what proteins and peptides are there," Cool said. "This is a huge development in the field. It lets a doctor take a biopsy from tissue and scan it in a new way."

The symposium also marked the official opening of Wright State's Proteome Analysis Laboratory (PAL), a state-ofthe-art new research facility within the pharmacology and toxicology department that features highly specialized equipment devoted to proteomics.



Richard Caprioli, Ph.D., delivers the Earl Morris Endowed Lecture during the "Proteomics in Modern Medicine" research symposium.

The PAL will allow university scientists and research partners throughout the region to apply processes such as those pioneered by Caprioli.

"The equipment allows greater detail and accuracy," Cool said, "in that we're looking more precisely at a broader range of peptides and chemicals in very defined regions of tissues and organs."

The symposium also featured presentations by Cool and Kenneth Greis, Ph.D., associate professor of cancer and cell biology with the University of Cincinnati and director of proteomics and mass spectrometry for the university's Genome Research Institute.

### Weight loss benefits, by the numbers

It stands to reason that if being obese puts additional strain on a person's muscles, bones, and joints, then losing weight should help to ease the burden. Clinical data to back up this assertion are surprisingly scant, though, so a team of physicians and scientists affiliated with the medical school resolved to remedy that oversight.

At the 2009 annual meeting of the American Academy of Orthopaedic Surgeons in Las Vegas in February, Richard Laughlin, M.D., professor and chair of the Department of Orthopaedic Surgery, Sports Medicine, and Rehabilitation, presented the results of a 12-month study of musculoskeletal function in bariatric surgery patients.

The study, conducted by Laughlin and a team of colleagues spanning multiple departments, focused on 50 women aged 20 to 74 who were scheduled for Roux-en-Y gastric bypass surgery. Before surgery and at three and six months following the procedure, investigators took physical measurements and asked participants to complete a Timed-Get-Up-and-Go (TGUG) test and two quality-of-life questionnaires.

While not surprising, their results were quite gratifying. After six months, participants demonstrated a mean improvement of 2.4 seconds, or 19 percent, on the TGUG test and scored higher in all components of the questionnaires.

The findings are significant, according to Laughlin, because they expand on work associating weight loss with a reduced risk of osteoarthritis and the need for total joint arthroplasty (TJA) by demonstrating concrete improvements in basic function.

The team hopes to build on these results by extending the study with data from patients 12 months after surgery. They would also like to launch a longer-term study with a larger patient population.

"Where we would really like to go with the project is to follow these people longitudinally with support from the Lifespan Health Research Center (LHRC)" at the medical school, Laughlin said. "We would like to look at bone density and other body composition parameters, as well as gait, balance, and overall function. We want to get a picture of how the patients function over the long term." "The surgery affects people's metabolism on a long-term basis," he added. "It changes the whole way patients eat and burn calories and metabolize everything. In the short term, this can also affect their ability to heal wounds. In addition, we want to describe patients' functional levels as they lose weight, so orthopaedic surgery can be scheduled for the optimum time."

In addition to Laughlin, the research team included Michael Iossi, M.D., and Manny Konstantakos, M.D., both residents in the department; Richard Sherwood, Ph.D., associate professor of pediatrics and community health and director of the LHRC; Dana Duren, Ph.D., assistant professor of community health and orthopaedic surgery, sports medicine, and rehabilitation, also with the LHRC; and Donovan Teel, M.D., bariatric surgeon and clinical assistant professor of surgery.

### **Snapshots**

### New home for the Department of Family Medicine



Joining Ollie Davis (fourth from left) at the ribbon-cutting ceremony for the new center were medical school dean Howard Part, M.D.; WSU president David R. Hopkins, P.E.D.; Michael Stephens, president of Sycamore Medical Center; Gregory Henderson, president of Greene Memorial Hospital; Julie Vann, mayor of Beavercreek; Frank Perez, CEO of Kettering Health Network; Ron Swiger, chaplain at Greene Memorial Hospital; and Mark Clasen, M.D., Ph.D., chair and professor of family medicine and professor of geriatrics.

With the opening of the Ollie Davis Medical Arts and Education Center, the Department of Family Medicine now has a new academic home and the Wright State Physicians Family Medicine practice has a customdesigned facility to deliver health care to the residents of the Miami Valley.

In February, Wright State Physicians Family Medicine moved from its former location in the Indian Ripple Family Health Center to the new Ollie Davis Medical Arts and Education Center at 68 Darst Road, Beavercreek. A grand opening celebration was held on May 27.

The new patient-centered practice location features state-of-the art electronic health records and on-site, high-tech imaging and laboratory services. The first floor features the lobby and waiting area, a large workstation, and 24 patient exam rooms, two of which are equipped with exam tables specially designed for geriatric patients. The top floor houses the Department of Family Medicine.

Wright State Physicians Geriatrics is also offering geriatric medicine services at the new medical facility. The Geriatric Medicine Clinic is now accepting new patients, referrals, and consults. In addition, Greene Memorial Hospital offers complete laboratory services on site, along with X-ray, CT, urine testing, a blood draw station, ultrasound, and a vascular lab.

"Education and state-of-the-art health care are inextricably bound," said Mark E. Clasen M.D., Ph.D., chair and professor of family medicine and professor of geriatrics. "This is confirmed by the evidence that teaching facilities

> The new patient-centered practice location features state-of-the art electronic health records and on-site, high-tech imaging and laboratory services.

provide better outcomes than non-teaching facilities. And the differences are not trivial. The Department of Family Medicine is the centerpiece of this concept, and future innovations will be tried and refined right here in this center."VS

### Preparing for the worst







Participants in the NCMR recertification course took part in an extended tactical field exercise that included rappelling down a cliff face to the site of a simulated plane crash with multiple victims, some of whom were stabilized and then evacuated by helicopter.

A small private plane lay in tatters on the rocks at the bottom of the abandoned quarry. A man was sprawled on the ground nearby, thrown from the cockpit. Another was trapped inside the plane. Rescuers rappelled down the cliff face to reach the crash scene below, while a helicopter hovered nearby waiting to take the injured to a hospital.

Visitors to Oakes Quarry Park in Fairborn last October may have thought they had stumbled onto a disaster in the making, or perhaps a movie set.

Instead, the park was the site of an elaborate tactical field exercise for U.S. Air Force and Army National Guard emergency personnel and civilian emergency medical technicians (EMTs), sponsored by the medical school's National Center for Medical Readiness (NCMR). The exercise, part of a unique weeklong recertification course, featured a realistic simulation of a plane crash amid rugged terrain, including the use of a full-size, wrecked private plane with volunteer "victims" and high-tech, remote-controlled medical mannequins inside.

Participants in the training assessed and responded to the situation using real procedures and equipment, including specialized gear designed to safely extract crash victims from the wreckage, provide immediate life-saving care, and lower them securely from a steep ridge to more stable ground. Miami Valley Hospital's CareFlight Air and Mobile Services also participated by providing a helicopter evacuation of the patients. The scale and realism of the intense scenario were exciting, but the nature of the course itself is equally remarkable, according to Mark Gebhart, M.D., associate professor of emergency medicine, director of EMS/medical readiness, and director of the NCMR.

"We're creating a fairly unique opportunity for military and civilian paramedics to work together, learn from one another, and lay the groundwork for better collaboration in the event of a real emergency," Gebhart said.

Disasters such as hurricanes or floods, disease epidemics, and terrorist attacks are all situations that can require a rapid, large-scale, and well-coordinated response by military and civilian personnel. Unfortunately, training that brings together first responders from both sides is rare, Gebhart explained.

The course attracted participants and observers from throughout the Dayton region and as far away as Utah and West Virginia. In addition to Wright State and Miami Valley Hospital, police and fire departments of several local communities and the fire department of Wright-Patterson Air Force Base helped to provide portions of the training.

### Surgery by remote

If a surgeon possessed four arms, the ability to see through skin and tissue, tireless endurance, and the precision and control of a finely tuned machine, it's easy to imagine how patients might benefit. Now, a high-tech robotic surgery system is bringing just these advantages to surgeons affiliated with the medical school.

The da Vinci<sup>®</sup> Surgical System consists of a platform with four robotic arms and a high-definition endoscopic camera, which a surgeon controls from a sophisticated, ergonomic console located several feet away. By attaching a variety of specialized surgical tools to the arms and looking through a fully immersive, three-dimensional viewer, surgeons can use the system to perform even complex minimally invasive procedures with greater precision and lower risk of complications. Minia Hellan, M.D., assistant professor of surgery in the Division of Surgical Oncology, trained on the system with some of the most experienced and innovative surgeons using it anywhere in the world. Following residencies in family medicine, obstetrics and gynecology, and general surgery, Hellan completed a surgical oncology fellowship at City of Hope National Medical Center in Duarte, California, where she developed her skill with the da Vinci system.

In essence, she said, the robotic surgery system represents an evolution in laparoscopic surgery.

"The goal of minimally invasive surgery is fewer and smaller incisions, faster recovery, less post-operative pain, shorter hospital stays, and a faster return to work and daily function," Hellan said. The da Vinci system provides all of these benefits and offers several advantages over standard laparoscopic procedures, which require the use of long, sticklike instruments that have limited maneuverability and can be awkward to handle.

In contrast, Hellan said, the robotic surgical instruments "have a 360-degree range of motion, and every motion of my hand is translated into a motion of the tip of the instrument. You can suture as if you were suturing [in] open [surgery]."

The robotic surgery system can also correct for accidental tremors in the surgeon's hands and can scale movements down to 25 percent, translating a gesture covering 4 millimeters into 1 millimeter of motion for the surgical instrument. This allows the surgeon to be exceptionally precise and careful.

#### **Pushing the envelope**

Robotic surgery is most common in the field of urology, where it has become the standard of care for prostatectomies. This kind of procedure is ideal for the system, because it involves delicate work in a very confined space. For similar reasons, robotic gynecologic surgery is also common, while cardiothoracic and thoracic surgery and procedures of the neck, liver, pancreas, and kidney using

Hellan (seated) and Marianne Keaton, R.N., prepare to perform surgery using the da Vinci system. The ergonomic console gives Hellan a three-dimensional view of the surgical field and allows her to manipulate tiny surgical instruments very precisely.



the system are evolving fields. The system hasn't been as widely applied in general surgery, which often requires the ability to move more freely throughout a larger area of the body.

Hellan is among a small group of physicians pioneering the use of the system in surgical oncology. In particular, she is one of just a handful of surgeons worldwide using the system to perform surgery for rectal cancer and is the co-author of several journal articles and a book chapter on the subject.

Due to her fellowship training, Hellan said, "I can offer this, but there are not too many places in the United States doing it."

Initial studies, many of them conducted in Europe, have shown that the surgery yields similar or better results when compared to traditional laparoscopic procedures. A large, randomized, domestic study has yet to be conducted, however, largely because the surgery is available in fewer than a dozen locations in the United States. Hellan is pleased to have added the Dayton area to that exclusive list.

"I really, really believe in the advantages of the robot," she said. "I believe in the minimally invasive approach. I think with the robot you can stretch the envelope more and probably do more sphincter-preserving [procedures]."

#### Giving residents newer and better tools

Michael Galloway, D.O., assistant professor of obstetrics and gynecology, director of gynecologic surgery, and associate director of the Obstetrics and Gynecology Residency Program, is also a big fan of the da Vinci system. He has used the system extensively for more than a year and considers it a wonderful resource, particularly for hysterectomies.

"Patients used to have to stay in the hospital for two to three days, have large incisions, have complications with healing, and face six to eight weeks of recovery," Galloway said. With robotic surgery, "they have a couple small incisions, and they're in the hospital overnight. Within two to three weeks, most are doing 95 percent of what they normally do."

The three systems in place in local hospitals are used so frequently by faculty and other physicians that the Miami Valley has become one of the top 10 locations in the country for robotic gynecologic surgery.

Building on this distinction and his own experience with the system, Galloway is working to make robotic surgery a formal part of the department's residency program. The surgical instruments are small enough to fit through tiny incisions and allow surgeons to operate with exceptional precision.

"We'll be one of the first—if not the first—to have a resident robotic training program," Galloway said. "Residents will be able to leave and be among the leaders at their facility, because they will know how to do robotic surgical procedures."

David Dhanraj, M.D., assistant professor of obstetrics and gynecology and director of minimally invasive gynecological surgery, trained on the system before joining the department in 2008. He is working with Galloway to integrate robotic surgery into the residency program.

"Da Vinci surgery training will be a significant element of our residency program," Dhanraj said. "As patients are becoming more aware of the option of having major surgery through very small incisions, it is critical to be able to train more physicians effectively in these advanced laparoscopic techniques. Our goal is for our residency program to become a leader in this area."VS

### **Snapshots**

# Medical school created \$850.5 million economic impact, 13,000 jobs in 2007



The Boonshoft School of Medicine, its medical student education and research enterprise, its faculty practice plan (Wright State Physicians) and the resident training and research enterprise of its affiliated hospitals contributed \$850.5 million to the state's economy in 2007, according to a study commissioned by the Ohio Council of Medical Deans. During the same period, they generated \$24 million in state government revenue and were responsible for supporting 13,334 jobs.

In addition to its firsthand impact, the medical school has an extensive network of operations through which its faculty, staff, researchers, students, and residents influence the academic and research health care industry of Ohio. The impact of the entire "academic health care industry" associated with the medical school, which includes the full activity of core and non-core affiliated hospitals, is substantially greater. Using these parameters, the study reports an economic impact of \$3.1 billion, \$89.9 million in state government revenue, and support for more than 46,000 jobs.

The report underscores the significant impact of Ohio's seven medical schools and their affiliated teaching hospitals in spurring growth as the state works to transform its economy.

"We are proud of the role the medical school and Wright State Physicians play as active members of our community," said Dean Howard M. Part, M.D. "Our strong partnerships with area teaching hospitals and health care institutions throughout the region form the foundation of our innovative community-based model." Among the report's other findings:

- For every \$1 provided by the state in direct support for Ohio-based medical colleges, approximately \$10 was returned in tax revenue.
- Ohio ranked sixth in the nation, behind only New York, Pennsylvania, California, Massachusetts, and Texas, in terms of the economic impact of its academic health care industry.
- Of \$628 million in National Institutes of Health (NIH) funding to the state of Ohio, 66 percent (\$413 million) was awarded to Ohio's seven medical colleges.
- Medical school graduates who remain within the state to practice medicine represent an additional impact of nearly \$700 million annually.

"Academic medicine is a critical growth engine for the state—spawning biomedical investment, producing jobs, stimulating commerce in related goods and services and generating tax revenue," noted David Stern, M.D., chair of the council and vice president for health affairs and dean of the University of Cincinnati College of Medicine. "Communities throughout Ohio rely on the state's medical colleges and teaching hospitals for job creation and attraction of new out-of-state and international investment as well as for high-quality health care."

### Medical school hosts national M.D./M.B.A. conference

Representatives of universities and institutions from around the country converged on the Wright State campus this spring for a high-profile national event.

The Seventh Annual M.D./M.B.A. Conference, whose theme was "Physician Leadership in the 21st Century," took place April 17-19 and brought together more than 50 students, professors, and program directors for a weekend of presentations, social activities, and collaboration.

James Ebert, M.D., M.B.A., M.P.H., FAAP, associate professor of community health and pediatrics and the Oscar Boonshoft Chair and director of the school's Center for Global Health Systems, Management, and Policy, opened and moderated the conference. Berkwood Farmer, Ph.D., dean of the Raj Soin College of Business, and Howard Part, M.D., medical school dean, each offered brief words of welcome to the participants.

During the conference, Anthony Nguyen, M.D., M.B.A., senior vice president and medical director of the health benefits company WellPoint Inc., announced the creation of a new Physician Executive Fellowship Program. The year-long program, slated to begin in fall 2009, will initially accommodate two fellows who "have a true passion for moving into a physician-executive role and truly driving organizational strategy."

The conference also included a judged poster session with several awards. More than a dozen medical students, postgraduate students, and faculty members presented their work on health systems, health economics, health enterprise, and health policy. On the final day of the conference, Windsor Sherrill, Ph.D., and pre-medical student Jason Crumpler, both of Clemson University, presented the results of a 10-year study of M.D./M.B.A. programs and their graduates. Their research "shows that on 10-year follow-up, 100 percent of M.D./M.B.A. graduates are still very happy about their choice of the dual degree."



### Public health summit explores healthy lifestyles

The small choices we make every day can have a tremendous impact on our health. Genetics, environment, and access to medical care all contribute to overall health, but lifestyle and behavior play a far more important role. Every choice we make, from whether to eat an apple or a donut, to whether to take the elevator or the stairs, can make a difference. This spring, a special Summit on Public Health explored ways that healthy lifestyles can promote individual and community health in the Miami Valley. The daylong event featured presentations and workshops on topics such as children's health, nutrition, physical activity, health disparities and cultural issues, and the importance of addressing chronic disease as a public health issue at the community level.

Attendees learned how to increase longevity through lifestyle choices, and why it is essential and effective to create healthy lifestyle initiatives as a matter of public policy, from keynote speaker Steven Aldana, Ph.D. Aldana has published more than 60 articles and seven books on ways lifestyle habits can help to prevent, mitigate, or reverse chronic conditions such as heart disease, cancer, and diabetes. He has also regularly served as a consultant to the Centers for Disease Control and Prevention and the National Institutes of Health.

The summit was co-sponsored by the Wright State University Boonshoft School of Medicine's Center for Global Health Systems, Management, and Policy; Public Health—Dayton & Montgomery County; Sinclair Community College; and the Hittner Community Health Event.VS

### Issues In Depth

Mark Rich wondered if the baffling affliction he saw in many critically ill patients and the biological process he was studying in

# **Translational Research:** Shortening the path from bench to bedside

an unrelated basic science lab might be connected in surprising and fundamental ways.

Phil Neal

John Bullock was determined to find answers—to understand why dozens of people around the world were suddenly developing a rare condition and losing their eyesight, especially given his strong suspicion that nobody else was asking the right questions.

Sonia Michail wanted to provide powerful and painless interventions to bring relief to her young patients, even if she had to venture beyond the limits of current medical knowledge to find a way to do so.

For all three of these physicians, compassion, curiosity, and a chance to contribute something new to the field of medicine led to forays into the exciting and increasingly important territory on the border between clinical practice and basic scientific investigation: the world of translational research.

#### **Breaking down barriers**

In communication, translation can be a powerful, unifying tool, capable of connecting people and ideas separated by seemingly insurmountable barriers of language and culture. In a similar way, translational research, in the biomedical arena, seeks to break down the walls between scientists and physicians, laboratories and hospitals, fundamental theory and practical applications.

At heart, translational research involves moving between "bench" and "bedside." When basic science investigators consider the implications of their work for the treatment of disease, or when physicians' experiences with patients lead them to rethink scientific principles or care guidelines, translational research is underway.

Traditional research, conducted by isolated investigators narrowly focused on a specific topic, can certainly yield great benefits and have a far-reaching impact. A primary goal of translational research is simply to accelerate this process, to make the



...this bench-to-bedside approach to translational research is really a two-way street. Basic scientists provide clinicians with new tools for use in patients and for assessment of their impact, and clinical researchers make novel observations about the nature and progression of disease that often stimulate basic investigations.

> -NIH Roadmap for Medical Research

implications of a given study for additional fields or contexts less of an afterthought, and more of an integral consideration.

### A new era in collaborative research

Nationally, support for translational research may be stronger than ever before. Since the launch of their Roadmap for Medical Research in 2004, the National Institutes of Health (NIH) have placed a strong emphasis on translational research. In 2006, the NIH created the Clinical and Translational Science Awards (CTSA) Consortium to help institutions promote innovative, interdisciplinary clinical and translational research.

The Boonshoft School of Medicine also has done a great deal to emphasize translational research, especially in recent years. Dean Howard Part, M.D., expressed this idea in his remarks to open the medical school's 2009 Central Research Forum, whose theme was "Translational Research."

In his two decades at the medical school, Part said, "the growth in the research domain has been astounding, particularly in the last seven or eight years... The basic scientists here on campus have really done a terrific job in not only linking up with our clinicians, but have been passionate about looking for opportunities to collaborate."

#### **Tales of translation**

To shine a spotlight on some of the outstanding translational research underway at the medical school, this issue of *Vital Signs* features three stories on groundbreaking work by faculty physicians and scientists.

The achievements and aspirations of Rich, Bullock, and Michail, in collaboration with their partners within and beyond the university, are exemplary, but they are hardly unique. Throughout the medical school, the university, and our wider community, talented and dedicated researchers are forging new connections, asking novel questions, expanding the boundaries of medical science, and rapidly bringing the benefits of each discovery to patients and populations in need.

These specific stories are presented with the intention of honoring similarly innovative work done by so many others and, we hope, of inspiring readers to seek out—or create—their own opportunities to engage in translational research.

# Critical connections: How collaboration, cross-training can translate to medical breakthroughs

In medicine, major victories sometimes lead to puzzling new challenges. For example, intensive care units (ICUs) today are making tremendous strides in helping patients overcome life-threatening illnesses, but many survivors experience debilitating weakness for months or even years afterward.

Mark Rich M.D., Ph.D., associate professor of neuroscience, cell biology, and physiology, worked with ICU patients during a fellowship on neuromuscular disease 10 years ago. Many had survived bouts with sepsis, a full-body inflammatory state often caused by serious infection, and a common complication among severely ill ICU patients.

Sepsis can lead to multi-system organ failure, coma, or death. Weakness among patients recovering from sepsis stems from issues of the muscles (myopathy) and nerves (neuropathy), which conventional medical thinking attributes to atrophied muscle fibers and dead nerve cells. Rich wasn't so sure. A hunch led him to look beyond the standard explanation and consider other possible causes of clinical illness myopathy (CIM), as the muscle condition is known.

"Muscle is electrically active," Rich explained, "and in these patients, we found that the electrical signaling is really absent or severely affected."

Even in tissue that appears healthy, as in many patients with CIM, a problem with the electrical signals that trigger muscle contraction could explain the loss of strength and function. Rich's initial investigation led to further studies to determine, with increasing precision, the nature of the muscles' electrical problem. He eventually traced the issue to sodium channels, proteins that regulate the electrical activity of cells. His hunch had paid off.

#### From bedside to bench and back again

Timothy Cope, Ph.D., professor and chair of neuroscience, cell biology, and physiology and director of the Comprehensive Neuroscience Center (CNC), has known and worked with Rich throughout his decade of research related to sepsis. He attributes Rich's success not to a single inspired insight, but to his training as an M.D./Ph.D.

"Because of his knowledge as a neurologist and his abilities as a scientist, he's able to do this kind of work," Cope said. "It's translational science in one of its finest examples."

Rich agrees that having one foot in the hospital and the other in a laboratory worked out well for him.

"First I saw the patients," Rich said, "and I was in a muscle sodium channel lab unrelated to this, doing basic science. That's what the real luck was."

This is why the creation of an environment where everybody brings something unique to the table, but all with the same kind of general theme, is critical.

> After establishing sodium channels as the source of CIM, Rich began to wonder if the related loss of nerve function, known as clinical illness polyneuropathy (CIP), might be similarly misunderstood. The question led him from the lab back to a clinical setting.

> Encouraged by studies showing that nerve cells removed from CIP patients, much like the muscle tissue in CIM patients, looked healthy but exhibited compromised electrical activity, Rich formulated a new prediction. If the nerves were not actually dying, but were afflicted by an electrical problem like the one he'd documented in muscle, function should return more rapidly.

"In studying patients, we noticed there was a subset who did recover very quickly," Rich said, "and again, that just didn't fit well with dying nerves." He theorized that rather than slowly regrowing dead nerve cells over the course of several months, some patients were able to restore sodium channel function by replacing faulty or depleted proteins, a process that sometimes took mere weeks.

The next step would be to study an animal model of the condition.

"It's the only way to do the study, because this electrical regulation is so complex," Rich said. "We don't know yet which factor is crucial, so you have to study it in its real situation with the disease."

His initial work based on nerve conductions through the skin seemed promising, but the results just weren't precise enough.

"To do a detailed study of the mechanism," Rich said, would require "intercellular recording, where you poke into individual nerve fibers."

An investigation of this type could provide the very specific information he needed, Rich knew, but the process is so specialized that only a few labs in the world are capable of it. Fortunately, his colleague, Cope, oversees one of them.

#### A true team effort

Rich and Cope came to Wright State together from Emory University in January 2005, along with colleague Kathrin Engisch, Ph.D. Cope had accepted a position as department chair, attracted by the opportunity to assemble a world-class team and build the university's strength in neuroscience.

One early mark of their success was the award of a \$4.8 million program project grant (PPG) by the National Institute of Neurological Disorders and Stroke in 2007. The award, which is the first PPG in university history, funds an array of collaborative projects focusing on the recovery of nervous system function following injury.

"These are the kinds of things that can happen when you have a group," Cope said. "This is why the creation of an environment where everybody brings something unique to the table, but all with the same kind of general theme, is critical."

For Rich's research on CIP, collaborating with Cope proved to be essential.

"Through a number of studies, their lab was actually able to determine that [CIP] appeared to be the same kind of problem as in the muscle," Rich said. "The hint was that it's the sodium channel protein again... that instead of having two different illnesses, one where muscle's shrinking and a separate one where axons are dying, we may have a single problem that's due to a single protein."

Based on these findings, Rich speculates that the impact of sepsis on other excitable tissue, such as the heart and brain, might also be linked to a failure of sodium channels. Some clinical evidence supports this idea with heart tissue, although it's far from proven, and the brain tissue connection is purely speculative. If the theory holds true, however, its implications could be profound.

"In that case we would have many of the different complications of sepsis—failure of muscle, nerve, heart, and brain—that might all be tied together by a single problem," Rich said. "That's not proven yet, but it's exciting."

"There's real encouragement from these findings," Cope added, "to think that there is a broadly based problem that comes back down to this single molecule he was first studying."



Rich (standing) and Cope have advanced their research by working closely with one another and other colleagues in the Comprehensive Neuroscience Center, which actively seeks to foster collaboration.

### The benefits of getting back to basics

Rich's research is gaining notice for several reasons. First, sepsis and its complications are becoming more widely recognized as a serious problem. A *New York Times* cover story in January explored the plight of ICU patients and efforts to prevent or reduce long-term complications. Second, his recent investigations of peripheral (sensory) nerves represent something of a breakthrough.

"This is first time we now show another tissue, other than muscle, has the same problem," Rich said. "That's why it's such a big deal."

In one sign of the rising profile of their work, the results of Rich and Cope's

nerve study were featured in the May issue of the *Journal of Clinical Investigation*. Rich has also been invited to present their findings at a conference in Germany and to join a clinical group in California establishing guidelines for studying patients with CIP and CIM.

Rich is cautious when discussing the potential impact of his research, but it is easy to see why the possibilities are generating so much interest. While most common among ICU patients, sepsis can also affect anyone whose immune system is compromised, including chemotherapy, organ transplant, or HIV/AIDS patients. More broadly, a better understanding of one of the body's primary electrical regulators could affect treatment of cardiac arrhythmia, seizures, chronic pain, and other disorders related to excitable tissue.

Cope is excited by these possible outcomes, and he understands and supports the drive "to accelerate the process of turning basic science discoveries into clinical treatments." Even so, he is concerned about the temptation to overemphasize translational research.

"The value of basic science has got to be recognized," he said, "even if there's not an immediate connection with one disease or another."

"If there hadn't been years of sodium channel research that was not directly, obviously clinically relevant," Rich agreed, "we would be at a big disadvantage in approaching this problem."

# An eye for the truth: On the trail of an international medical mystery

When John D. Bullock, M.D., M.P.H., M.Sc., FIDSA, FACE, paid a visit to a friend and colleague on an early March afternoon in 2006, he expected nothing more than some casual conversation in pleasant company. Instead, he found the first clues to a global medical mystery he would spend the next three years unraveling.

An ophthalmologist by training and former professor and chair of ophthalmology at the medical school, Bullock was visiting Ronald E. Warwar, M.D., who had taken over Bullock's private practice a few years before. When Warwar mentioned a patient with an unusual condition—a fungal corneal ulcer—Bullock's curiosity was piqued. Once he learned that Warwar actually had two patients newly diagnosed with the condition, Bullock knew the occurrences were no coincidence.

"That was an immediate alarm bell," Bullock said. "In over 25 years of clinical practice, I had only seen one case, and yet here were two cases in the same practice within a week."

His concern arose from more than decades of personal experience, however. In addition to earning a medical degree from Harvard University and a master's degree in microbiology and immunology from Wright State, Bullock returned to Harvard and received a master of public health (M.P.H.) degree in 2003, concentrating in quantitative methods and epidemiology. He also completed additional course work at the London School of Hygiene and Tropical Medicine and became a Fellow of the Infectious Diseases Society of America (FIDSA) and the American College of Epidemiology (FACE).

This specialized training prepared him well for his current position teaching infectious disease epidemiology in the Wright State M.P.H. program as a clinical professor of community health and professor of mathematics and statistics. It also gave him the tools to recognize his colleague's cases as the first signs of a serious disease outbreak.

He did some quick calculations on the chances that two patients would independently develop such a rare condition in this short interval of time.

"The probability of that was in the tens of millions to one," Bullock said. "Some brand new factor was in play."

### Sounding the alarm on a global outbreak

Bullock and Warwar followed up with some online research and discovered a report of nearly 40 similar cases a few weeks earlier, but half a world away in Singapore. The patients there had developed corneal ulcers caused by a specific type of fungus, *Fusarium*, and nearly all had used the same type of contact lens solution: ReNu<sup>®</sup> by Bausch & Lomb.

Bullock immediately checked the cultures from Warwar's patients and inquired about the products they'd been using. On both counts, their cases were a perfect match. Each was suffering from *Fusarium* keratitis and had used the same solutions as the patients in Singapore. Bullock had uncovered evidence of a global outbreak.

"The next step was to contact the CDC (Centers for Disease Control and Prevention) and the FDA (Food and Drug Administration)," Bullock said.

His calls came in just two days after the organizations had received similar reports of three cases in New Jersey. Bullock's information confirmed the severity of the situation and led to the launch of a national investigation.

"It's unusual to have *Fusarium*, in the northern climates," he explained. The fungus is common in tropical settings like Singapore, or even parts of Florida, but "in the northern states in the winter... to see it in one state, you kind of scratch your head, but to see it in two states, then the CDC and the FDA realized something serious was going on."

### Refusing to accept the easy answers

When preliminary inquiries turned up additional cases in other states, the FDA notified Bausch & Lomb and launched an investigation of the company's manufacturing plant in Greenville, South Carolina. The CDC began issuing updates on the outbreak in April 2006, and the company halted domestic shipments of ReNu with MoistureLoc<sup>TM</sup>, the product associated with most of the cases, on the same day. A recall of products already shipped in the United States, and then worldwide, followed shortly after.

As updates on the outbreak, and its causes and containment, came out day by day, Bullock remained skeptical. He continued to gather his own information online, conducting a second-hand investigation based on documents from the company, the FDA, and the CDC, as well his own review of the scientific literature and other information sources. And he found himself reaching conclusions at odds with the official explanations.

"This solution was made in four factories around the world: in China, India, Italy, and South Carolina," Bullock said. "However, cases of *Fusarium* were traced only to the South Carolina plant. Right away you know that something's funny."

Extensive testing had found no contamination in the U.S. facility or the

solution produced there, however. Also, patients in different locations were affected by different strains of the fungus, ruling out a single, central source. These findings led the company to conclude and report—that at least part of the problem arose from improper use of its product. By failing to follow usage guidelines, customers in far-flung locations had compromised the product, rendering them vulnerable to distinct, local strains of the fungus. Bullock disagreed.

"In point of fact, no patient ever follows the instructions exactly right" when it comes to contact lens care, he said. "We call that noncompliance."

In addition, both of Warwar's patients happened to be experienced health care providers. If anything, they were more likely than the average consumer to use eye care products properly. To Bullock, blaming the patients just didn't make sense.

If patient behavior, exposure to *Fusarium* (which is common worldwide, though it typically thrives in warmer climates), and the specific product were the same everywhere, he argued, one wouldn't expect every case to be linked to shipments from a single location.

"You have the same noncompliant patients all over the world, the same fungus, and the same solution," he said. "If that's all it was, then wouldn't you expect to trace cases to each of the four factories?"

#### Turning up the heat

When the FDA released a report on its investigation of the South Carolina manufacturing plant, Bullock pored over it for some hint of potential problems with the solution produced there. Eventually, he found it: the company had failed to regulate the storage and transport temperatures of the solution. "The bottle says to 'store at room temperature," Bullock said, which implied that failing to do so might have harmful consequences. Possibly due to the absence of contamination at the plant and the diverse *Fusarium* strains involved in the epidemic, however, the FDA did not consider the temperature regulation problems overly serious.

Unconvinced, Bullock conducted further research and turned up a guidance document issued by the FDA in 1997, which cautioned that increasing the storage temperature by only 10 degrees Celsius would cut the shelf life of contact lens solutions in half. Furthermore, the impact of rising temperatures was exponential: storing the solution at 30 degrees above room temperature would reduce the shelf life by more than 85 percent.

As updates on the outbreak came out day by day, Bullock remained skeptical. He found himself reaching conclusions at odds with the official explanations.

Bullock wondered if temperatures in Greenville in the summer might reach dangerous levels inside non-climate controlled warehouses, delivery trucks, or overseas cargo containers. As an easy, initial test, he placed a thermometer inside his own car and left it sitting in the sun on a typical Ohio summer day. When he returned after several hours, the outside temperature was 91 degrees Fahrenheit. Inside the car, it was 166.

Surprised and encouraged by his findings, Bullock did additional research and found an earlier study of a solution used to treat glaucoma, which degraded when exposed to high temperatures. He also looked up data from the National Oceanic and Atmospheric Administration on summer temperatures in Greenville, and additional documents on storage and shipping temperatures in the region.

"Now we have a puzzle," Bullock said, "and we have two pieces. We have a company that has been officially cited by the FDA for inadequate storage and transport temperatures. We have actual data showing how hot things can get inside cars, warehouses, trucks, and cardboard containers, where the temperatures can be enormous."

The next step, he said, was to try to create the same conditions in a laboratory setting to see how the solution might be affected.

### Pinning down the real problem

Bullock and Warwar worked with B. Laurel Elder, Ph.D., associate professor of pathology and internal medicine, and William I. Northern, M.S., of CompuNet Clinical Laboratories, during the next phase of their investigation. They maintained samples of several contact lens solutions, including both recalled and currently available products by Bausch & Lomb, at a constant temperature of 140 degrees Fahrenheit for four weeks. They then added each solution to a broth containing *Fusarium*.

"We then looked at the difference between the high-temperature storage versus room temperature storage," Bullock said. "And the biggest difference that we found was with this Bausch & Lomb solution."

> Bullock (seated) and Warwar wanted to know the real story behind local cases of keratitis linked to a worldwide outbreak. Their persistence led to an elaborate research project, multiple papers and presentations, and an explanation that earned media coverage around the globe.



Based on these initial results, Bullock, Warwar, and Elder followed up with a broader and more specific study. In addition to the two strains of *Fusarium* available locally, they tested two provided by Stanford University and seven, obtained from the CDC, collected from patients involved in the original U.S. outbreak. Using the same approach, Bullock and his colleagues tested all 11 *Fusarium* isolates and four contact lens solutions, using multiple assays for each combination. As in the pilot study, the ReNu with MoistureLoc solution stored

<sup>6</sup> One of the tenets of public health is that you find out. You get these answers. You don't want to deal just with the original epidemic. You want to do the after-analysis, and that's part of downstream prevention.<sup>99</sup>

> at high temperature fared the worst. It allowed fungal growth nearly 80 percent of the time, while the same solution stored at room temperature developed fungus in only 32 percent of the tests.

"After all this work, we found exactly the same conclusion as we had in our initial pilot study," Bullock said. "But now we had the evidence in spades, and it was absolutely irrefutable."

He and Warwar presented their results at the 2008 annual meeting of the American Ophthalmological Society. Their findings created quite a stir, and the American Medical Association published a report of their study in the November 2008 issue of the *Archives of Ophthalmology*. Once the journal article appeared, global media coverage quickly followed. "There were articles from India, from England, literally from all over the world describing our paper," Bullock said.

He attributes the widespread interest to the same impulse that led him to conduct the research: a desire for answers. Two years after the outbreak and initial investigations into its sources, no one had pinpointed an exact cause. A number of researchers at various institutions had conducted studies, but Bullock believes they were asking the wrong questions.

"All the people who looked at it were trying to model a noncompliant scenario," he said, searching for patient behaviors that might have played a role.

A few studies identified conditions that could conceivably lead to the creation of biofilms that would permit the fungus to persist, but once again, the same issue should have affected solutions from all four manufacturing plants equally.

#### Learning from the past; protecting the future

In May 2009, Bullock again presented a paper at the annual meeting of the American Ophthalmological Society. Based on his statistical studies and reviews of documents from the FDA and other sources, he performed a detailed root cause analysis of the outbreak. The paper outlines his findings and includes recommendations to help prevent future epidemics.

In addition to publishing the current paper, Bullock, Warwar, and Elder hope to conduct follow-up studies to explore the causes of the keratitis outbreak in still finer detail, possibly at the level of individual chemical interactions. With the implicated product no longer available and the broader contributing factors identified, some would consider this work complete, but Bullock and Warwar insist on going further. The first reason for his continued interest is strictly personal, Bullock admits. His scientific hero is John Snow, M.D., the British physician and pioneer in the fields of epidemiology and public health, whose work famously halted a cholera outbreak in London in the 1850s. Like Snow, Bullock feels driven to apply his expertise to address puzzling public health issues. Bullock's work has been included in scientific publications more than 200 times, and his investigations have led to multiple product recalls and requirements for new warning labels.

"I've always been attracted to rare cases," Bullock said. With the keratitis outbreak, he continued, "I thought, 'I'm an ophthalmologist, I'm a microbiologist, and I'm an epidemiologist, and I should be able to figure this out.' I saw this as a challenge... It's a great intellectual mystery."

Still more importantly, he wants to be sure this particular problem won't arise again. The outbreak ultimately affected more than 150 people on multiple continents, leaving many with incurable eye conditions, including blindness. For Bullock, addressing any preventable risk of a similar outbreak is imperative.

"One of the tenets of public health is that you find out. You get these answers," Bullock said. "You don't want to deal just with the original epidemic. You want to do the after-analysis, and that's part of downstream prevention."

"It's important for the future to find the complete answer to this," he added, "so that some other set of circumstances doesn't lead to the same thing."

# Gut check: Mapping the vast, vital world of microflora



Michail was inspired to conduct research on the gut microflora to explore new and better ways to help children battling a variety of gastrointestinal disorders.

The human body, in all of its breathtaking complexity, has inspired and mystified artists and scientists throughout history and aspects of its form and function defy complete understanding even today.

Within our bodies, however, exists an even vaster, largely unexplored world that may provide answers to many of our most puzzling and persistent questions.

This is the realm of intestinal bacteria called microbiota or microflora—the trillions of microorganisms that live in our digestive tracts and outnumber the body's own cells by a ratio of 10 to one. A pair of researchers at the medical school are investigating this uncharted territory in hopes of expanding basic biological knowledge and discovering more effective medical treatments for patients.

Sonia Michail, M.D., associate professor of pediatrics, and Oleg Paliy, Ph.D., assistant professor of biochemistry and molecular biology, are collaborating on a series of projects that focus on the role of microflora in gastrointestinal disorders of children. Their first two studies, already underway, are both funded by grants from the National Institutes of Health (NIH) through the National Center for Complementary and Alternative Medicine. The studies were designed to bridge the gap between basic and clinical research. "Our hope is to take things from the bench and help children at the bedside," Michail said, a shared goal that led the physician and the scientist to embrace the idea of collaboration.

"Our Ph.D. colleagues do a much better job about basic research in general," she explained, "but I feel we're the connection to the patients we see."

### A fascinating field rich with promise

As a pediatric gastroenterologist, Michail works with dozens of young patients each week who battle conditions such as Crohn's disease, irritable bowel syndrome, and childhood obesity.

With many patients, Michail said, "you know how to take care of them, and the medicine works very well, but the ones who have limited options are the ones we need to work a little harder for."

The promise of better methods of treatment or prevention strongly appealed to her, but the potential benefits of microflora research extend well beyond her specialty.

Each new study published in this growing area of inquiry, she said, provides more evidence "that would suggest that the organisms we harbor in our gut decide for us whether we get sick or stay healthy."

In addition to gastrointestinal disorders, intestinal microbiota have already been linked to some allergic skin disorders, respiratory problems, and infections of the urinary and reproductive systems. "And those are just skimming the surface," Michail said. New connections between microflora and various disorders are announced so frequently, she said, that "it won't be surprising if any disease is going to be somewhat related to the microflora... The sky is the limit."

Still more exciting are recent reports indicating that simply altering the gut microbes can produce dramatic changes in the host. Studies have shown that lean and obese mice possess markedly different microflora, and transferring microflora from obese to lean mice causes the recipients to become obese. This pattern seems to hold true in humans as well, based on research showing that obese and lean adults have different microflora, and that as obese individuals become thinner, their microflora change to resemble those of leaner people.

"What people found was that in obese animals, their intestinal microbes were too good at extracting extra energy from the diet," Paliy said, "and this extra energy might have led to weight gain."

Based on these astonishing findings, Michail and Paliy wondered if similar results might be possible for children.

#### **Breaking new ground**

Paliy and Michail's first NIH grant funded research to compare microflora from healthy children to those of patients with irritable bowel syndrome. Right from the outset, though, they confronted some daunting challenges.

"This is unexplored territory in pediatrics," Michail said. "It is completely new for kids. It's exciting, but at the same time, we're learning a lot as we go."

"Most of the studies of intestinal bacteria have been carried out in the adult population," Paliy explained. "Thus, we cannot tell how much of what we



Paliy poses with the custom microarray—a chip with many thousands of oligonucleotide probes designed to test for the presence of selected DNA fragments—he and Michail developed to survey the gut microbiota.

currently know about microbiota holds true for children."

Before they could begin analyzing the role of microbiota in specific diseases, they had to solve a more basic problem: finding a way to identify the microbes and study their activity.

Of the hundreds of bacterial species that make up the majority of the microflora, most are obligate anaerobes, or organisms that die in the presence of oxygen.

"At least 90 percent of them cannot be cultured," Michail said. "The traditional way of looking at the bacteria would not be helpful in our situation."

Rather than growing and observing bacterial samples in a controlled laboratory environment, Paliy and Michail had to rely on more specialized methods. Drawing on Paliy's expertise, they developed a new tool to catalogue intestinal bacteria and document their activity by examining the DNA from bacterial cells directly.

This approach had several advantages. First, it would work even for bacteria unable to survive or multiply outside of the intestine. Second, the tool could be used to profile stool samples, eliminating the need for a patient biopsy. Finally, it offered a very efficient way to study nearly 800 species of bacteria using a single test.

Paliy achieved these advantages by using a custom microarray—a chip containing tens of thousands of microscopic oligonucleotide probes that can each test for the presence of specific fragments of DNA.

"Our labs have put a lot of effort, time, and expense into validating this microarray," Paliy said. "Before using this tool on human fecal samples we had to make sure that it functions correctly when tested with known bacterial DNA. The medical school was very helpful in the initial stages of our collaboration by providing funds to pay for the development and testing of the microarray. Without such help, we wouldn't have been able to obtain further NIH funding."

After validating the tool, they studied a small number of samples from healthy children and adults in a pilot study.

Right away, Michail said, "We noticed some significant differences between the two populations. Our next step is to expand our data with more subject numbers."

"It appears that older children differ from adults in the relative amounts of various types of bacteria they have," Paliy said. "This is something that has not yet been recognized in the field."

Paliy and Michail then enlisted the aid of Nicholas Reo, Ph.D., professor of biochemistry and molecular biology and director of the school's Nuclear Magnetic Resonance (NMR) Laboratory. Using NMR spectroscopy, which measures the response of cellular nuclei to magnetic fields, Reo was able to help his colleagues collect data on the metabolic function of the microbiota.

### Ancient medicine on the cutting edge

While the current investigation is exploring intriguing new territory in terms of basic science, Michail's goal is to translate this knowledge into tangible benefits for patients.

"The whole idea is not just to study the microflora—the names of the bacteria and what they're doing," she said. "It's how to ultimately manipulate [them] to the advantage of the child."

To that end, Paliy and Michail's second NIH grant funds a study of probiotics, or live microbes that patients can consume to encourage the development of health-promoting microflora. While this idea may sound exotic, probiotics are commercially available as dietary supplements and are included in some foods, such as specialty yogurts and beverages. They are also hardly newcomers to the world of medicine.

"Probiotics were talked about in Biblical times" and used even earlier, Michail said.

"We're just beginning to understand how they work and how to apply them."

During a post-residency fellowship in pediatric gastroenterology and nutrition at Creighton University in Omaha, Nebraska, Michail said, "my mentors were interested in probiotics. I did most of my basic research training as a fellow in this area."

The leap from understanding processes at work among the microflora to influencing those processes with probiotics is a very feasible and appealing one, she believes.

"For example," she said, "we found an organism in the gut of healthy children that children with inflammatory bowel disease (IBD) do not have. That particular organism could be a good example of a probiotic that could be developed to help patients with IBD."

#### A future full of possibility

In addition to attempting to replicate their results with a larger group of patients, Paliy and Michail have planned a number of follow-up studies and are pursuing funding to investigate the role of microflora in conditions such as childhood obesity and Crohn's disease. They are confident about the direction and prospects of their work because of its strong potential for profound patient benefits.

"If you take obesity as an example," Michail said, "if you can modify the microflora before the child becomes obese by simple things related to diet or supplements, then you are more likely to prevent a national epidemic that costs the country billions of dollars and causes significant health and mental problems."

After studying differences in the microflora of obese and lean children, Paliy and Michail hope to measure the impact of a particular prebiotic—a non-digestible carbohydrate that nourishes helpful bacteria inside the intestine and reduces microbes linked with obesity.

"We think that may be one easy and effective way of stopping overweight children from becoming obese," Michail said.

Paliy and Michail have begun sharing their initial results, which have attracted a lot of attention. A paper describing the development and validation of the custom microarray was published in the June issue of the journal *Applied and Environmental Microbiology*. They have also presented their findings at a number of conferences, and Michail said the response has been "overwhelming."

#### <sup>44</sup> This is unexplored territory in pediatrics. It is completely new for kids. It's exciting, but at the same time, we're learning a lot as we go.<sup>99</sup>

"People are asking to collaborate, asking questions," she said, "and we've been invited to begin some new projects."

Based on their initial success and numerous possibilities for moving forward, Paliy and Michail plan to continue their remarkably fruitful partnership—an arrangement they also enthusiastically recommend to their colleagues.

"It would be very satisfying to see more research happen on the clinical side," Michail said, "and more cooperation between the clinical faculty and the research faculty."

"I think both myself and Dr. Michail realize that what we are doing together as a team, we would not be able to accomplish on our own," Paliy agreed.

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# A Second Opinion

# Getting started on your research: Practical advice for clinicians

Ronald J. Markert, Ph.D.

The appeal of academic medicine for many physicians is the opportunity to teach medical students and residents while practicing their medical or surgical specialties.





Once established as a clinician-teacher, faculty often become curious about the research component of the traditional academic three-legged stool (teaching, service, and research). Though strong in the first two areas, clinical faculty may feel a need for guidance and mentorship to develop their research skills.

Over the years, I have taught and collaborated with many clinicians as they pursued an interest in scholarly activity. In this column I offer some practical advice for clinician–teachers who are interested in research but may lack the experience (not to mention time and resources) to proceed with confidence.

In my experience, three characteristics distinguish those clinical faculty who are especially productive in their research activities. First, they are more *intrinsically* than *extrinsically* motivated. A salary increase or academic promotion (extrinsic motivators) may provide encouragement, but the drive to discover new clinical knowledge, answer important patient-related questions, and advance the practice of medicine or surgery provides a far stronger motivation.

Second, they recognize that *collaboration* increases *productivity*. Working with faculty colleagues, technologically savvy staff, medical librarians, research assistants, biostatisticians, and others who share your interests or possess unique skills or knowledge can allow you to accomplish far more than you might on your own.

Third, they exhibit two key personal qualities: *patience* and *organization*. Research has a natural rhythm that cannot be rushed, and it takes a methodical orderliness to manage tasks and challenges such as generating a hypothesis, reviewing relevant literature, planning a study design and research methods, obtaining Institutional Review Board (IRB) approval, implementing an intervention (if necessary), monitoring data collection, analyzing data, and writing a manuscript.

Whether or not you possess (or care to develop) these characteristics, the following tips can help you produce sound research and enhance your scholarly activity credentials:

**Focus.** I am apprehensive when anyone tells me, "This research will produce four or five papers." My advice: focus on your best research question, produce a quality study and an eloquent paper, and then go on to your second-best idea.

**Be specific.** Frame a research hypothesis (or question) that will be clear to the reader (or grant reviewer). For example, say, "Treatment X will result in fewer hospitalizations," rather than "will produce better clinical outcomes."

**Don't be afraid to sail alone.** Most of us will not be as fortunate as Telemachus in *The Odyssey*, whose wise guide (the original Mentor) told him, "The goal that has eluded you shall not do so for long. I am too good of a friend. I will rig a fast-sailing ship for you and sail with you myself." The contributions of supportive faculty and resourceful staff can be invaluable, but you can certainly be productive without assistance if you commit to learn how research is done and carve out dedicated time for your work.

**Develop a timeline.** Research studies involve many steps and occasional setbacks. Establishing a sequence and schedule for the completion of tasks will keep you on target and give you an ongoing sense of accomplishment.

Ask an expert. In reviewing the literature, you may discover researchers with valuable insights related to your study goals. Don't hesitate to contact these experts for advice—most will be flattered to have a distant colleague interested in their work, and they often will be pleased to advise you.

#### Consider an exploratory study first.

"Starting small" with an exploratory study involving a few subjects may not provide the statistical power to make inferential claims, but it will allow you to do a preliminary test of your hypothesis and research methods (and perhaps improve both), and to determine the number of subjects needed for a largescale investigation.

Start your manuscript early. Dr. Alex Roche, Fels Emeritus Professor of Community Health and Pediatrics at Wright State, once told me that research isn't research until it is published. With this in mind, become familiar with report guidelines for specific research designs, and start your paper before data collection is complete. While data gathering proceeds, you can assemble relevant literature and incorporate results from these studies in your Introduction, complete the Methods section of your paper, and construct blank tables for your Results. Doing this without your data will also help you think and write in an original and clear manner, and you will be better prepared to attack the Discussion and Conclusion when all the data are in.

Research for the right reasons. While extrinsic motivators have their place, scholarship in medicine and surgery is best when inspired by the goals of advancing science and improving patient care. Winston Churchill said it best: "Neither look for nor expect gratitude, but rather get whatever comfort you can from the belief that your effort is constructive in purpose."

Dr. Markert is Professor of Internal Medicine and Orthopaedic Surgery, and Vice Chair for Research in the Department of Internal Medicine, in the Boonshoft School of Medicine.



# 1,000 Words

During a public health project in India, fourth-year M.D./M.P.H. student Luke Rothermel (bottom, second from right) visited the village of Banchari with friends from the Sukhdev Raj Soin Hospital for the national holiday of Holi. Also known as the "Festival of Colors," this springtime celebration lasts several days, opens with large public bonfires, and features a tradition of blanketing crowds of revelers with dyed powder or water. For more on Luke and his experiences, see page 40.

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### **Faculty in Focus**

# Paul Koles Using all his gifts

**Cindy Young** 

A teacher to his core, Paul Koles can't help himself. When asked what he does at the Boonshoft School of Medicine, he carefully lays out his four major roles and then methodically explains them one by one, searching for the precise words to explain his meaning.

He does the same when asked about what attracted him to medicine or what he does in his spare time. Habits honed during a career of explaining complex medical concepts to eager medical students are hard to break.

"I would say that I have four major roles here," Paul Koles, M.D., associate professor of pathology and surgery and director of pathology education, explained. "I'll list them in the order of how I spend most of my time."

#### Educating medical students in pathology (and much more)

The recipient of the medical school's Faculty Mentor Award in 2004 and the Teaching Excellence Award from second-year students for an unprecedented six consecutive years, Koles clearly teaches much more than just pathology.

"You know that students come first for him because he'll always take as long as you need to explain a concept to you," said second-year student Ashkahn Golshani. "I appreciate the fact that no matter how busy he is being the director of pathology education, he still values that one student. He remembers your name and everything about you."



Koles said a love for teaching and learning is what drew him to the medical school. "I've always enjoyed the teaching of pathology and was involved in the training of pathology residents at Kettering Medical Center from 1986 until about 1995," Koles said. When the pathology residency program was discontinued in 1995, Koles found that he missed the teaching role. He taught pathology at the Wright State School of Medicine from 1986 to 2001 as a clinical faculty member, but was much more heavily involved in training residents. "When the path residency ended, I felt that I wasn't using all my gifts," he said. "I needed more interaction and stimulation through the teaching and learning aspects of pathology." When a full-time faculty position at the medical school opened up in 2001, he took it.

The first two years of medical school are intense. Students are expected to master human anatomy, the molecular basis of medicine, cell and tissue organ systems, principles of disease, pathology, neuroscience, the mind, and all the major systems of the body, in addition to the social and ethical issues of medicine and an introduction to clinical medicine. Figuring out how to pack all that knowledge into a human brain in two short years in a way that it can be instantly retrieved and put into practice with actual patients is one of the things that fascinates Koles. Over the years, he has refined his methods.

"When I was in med school, the preclinical years were just basically opening up a fire hydrant of information for us to swallow, and we were expected to figure out how it would be best used later," he said. Koles believes that although mastering the information is critical, requiring the students to apply the knowledge effectively is just as important. "Students learn best when challenged to apply their knowledge rather than simply to absorb knowledge," he said. "He makes you understand there's a reason for us painstakingly learning all these details, because it's going to end up saving this person's life or increasing the quality of their life somehow," said Golshani.

Koles has learned that what works when teaching residents doesn't always work with medical students. "One method that used to work very well in residency, but didn't work as well with medical students, is small group discussions," he said. Unlike with residents, group discussions with medical students led by a faculty member seemed to favor the more extroverted or aggressive students and didn't involve all the students well. "And that's why I switched over to team-based learning," he said. "Because it really requires participation of every student in the class."

Team-based learning (TBL) originated as an instructional method, developed by Larry Michaelsen, Ph.D., for business students at the University of Oklahoma. In 2002, the Boonshoft School of Medicine piloted TBL in several courses. The school then implemented TBL throughout the pre-clinical curriculum, becoming one of the first medical schools to do so.

Students are assigned to teams with six or seven members early in their first year. Teams work together in every core course, allowing them to build trust, hone communication skills, and learn together throughout the academic year. Traditional lectures and coursework complement TBL.

At the end of their second year, students must pass the U.S. Medical Licensing Exam (USMLE) Step 1. USMLE Step 1 is the most important exam they will take. They must pass it to continue on in medical school, and their score affects what kind of residency they will get after graduation. The exam is comprehensive, covering everything they've learned in the first two years. It's a critical time for all students, but some struggle more than others.

The students know they can come to Koles for help. "He'll carve out any time that you need to sit down and talk with him," said second-year student Doria Thomas. "Even if it's not about pathology. If it's about life, he'll sit down and talk with you."

"I've had that experience where I realize that some of my students are not really achieving the goals they need to achieve to become physicians," Koles said. "Sometimes there are personal issues that are outside the educational milieu that are compromising their ability to learn, and sometimes it's studying and learning skills that are not mature and adapted to the high volume of information that they must learn while being medical students."

Koles has become the go-to guy for study tips. "When I was completely lost about how to study for the boards, I went and talked to him about it," said Golshani. "He sat down and talked to me and helped me figure something out. He has experience throughout the years of what works and what doesn't work, and he'll help you find what works for you."

"Most of it is simply organizing time in an efficient way, because they're all capable of learning the material," said Koles. "It's organizing time, but it's also methods of using the time to find out what their areas of weakness are."

Teaching isn't just a one-way street for Koles. "I've learned that in my attempts to teach, I end up being a co-learner with my students," he said. "I end up being challenged by them to understand and seek a more complete understanding of whatever I'm teaching. They have challenged me to become a better learner because they are so aggressive, committed, and appreciative of high quality teaching."



Koles works with students during a team-based learning exercise, which encourages students to work together in small groups as a way to master the class material and practice the kind of professional collaboration they will eventually experience as physicians.

### Administration

Koles said his second role is administration. Because he is one of only two full-time faculty pathologists in the medical school, much of the teaching is done by full-time faculty in other departments and by clinically affiliated faculty who are practicing pathologists. "My role is to keep them involved in the educational process, to appreciate their contributions, and to recruit new ones to get involved in medical education as needed," Koles said.



"The number three role is research, and my particular interest is medical education research," Koles said. He's currently working on a paper exploring the relationship of team-based learning to student performance on major course examinations. "We're showing a measurable improvement in their performance on examination questions when they have been exposed to team-based learning to learn that material," he said.

2009 graduate Ersie Pouagare credits the TBL quizzes developed by Koles for helping her master information critical to passing Step 1. "His quizzes are very hard," she said, "and we don't appreciate them at the time because we're just worried about grades. But looking back, and I've talked to multiple people about this, Dr. Koles' quizzes were the best things that ever happened to us." Her advice to second-year students: "Focus on the quizzes and listen to Dr. Koles."

Like many faculty members, Koles struggles with balancing his individual scholarship goals with his demanding role as an educator. But even in his research, the focus is on teaching. "I want to do both," he said. "I want to become more productive as a scholar in medical education, but I also feel the need to do what's best for my students. Right now the students are getting the lion's share of the time."



#### **Clinical practice**

Koles does clinical practice far less than he used to, but it still occupies about 10 to 15 percent of his time. Koles does cytopathology of the thyroid gland for three endocrinologists. He examines fine needle aspiration biopsies of cells from the thyroid gland for diagnosis. He handles about 400 cases a year.

Even when he's working on his practice, he takes time for students. "Many times if I would need help with Step 1 planning and studying, he would let me come in," Pouagare said. "He would always clear his desk and take out a notepad and write down a plan with me."

Koles also conducts 10 to 15 autopsies each year through the Boonshoft School of Medicine Regional Autopsy Services. This work provides a service to the community and education for students in pathology and anatomy.

#### My decision to go into medicine was based on three things:

"The first was that I'm committed to a lifestyle of service to others," he said. "I'm a Christian, and I believe my role in this world is to serve other people. So I was looking for an occupation, a career really, a profession in which service to others was paramount."

The second factor was a chance encounter in the summer of 1972 with Arthur Weaver, M.D., a head and neck surgeon at Wayne State University School of Medicine. Weaver offered Koles a place to stay during his summer ministry. "He became sort of a hero to me, a role model of how one could combine the practice of medicine with real service to others," he said. A theology major with a minor in chemistry at Andrews University in southwest Michigan, Koles had been considering other careers, including becoming a high school teacher or college professor. "But when I met Dr. Weaver, I saw that a physician was in a unique position to have a positive impact on others," he said.

"And the third factor was, I always loved the biological sciences," he said. He spent the last two years of college doing all the pre-med requirements and applied and was accepted to medical school at Loma Linda University. He was the first one in his family to become a physician.

When he isn't teaching students, Koles enjoys spending time with his wife and three children, playing tennis, and wilderness backpacking. But even then, he finds ways to work in some time for teaching. "I enjoy teaching in my local church congregation," he said. "I get a lot of enjoyment out of that."

And what gives him satisfaction at work? "I think the greatest satisfaction is seeing a student rapidly develop from the beginning of med school through graduation," he said.

Pouagare is one of those students. Following in his footsteps, she started her residency in pathology at Tufts Medical Center this summer. Koles was there for her during this year's Match Day. "He supported me during Match Day when I found out I was going to Tufts," she said. "That really meant a lot to me, because my family couldn't be there that day. He was standing up and cheering for me."

As she starts the next step in her journey, Pouagare expects to think about Koles a lot. "Next year when I'm studying and probably going to be very overwhelmed, I'm just going to think about his work ethic and his knowledge," she said. "It will motivate me to work harder. Thank you for being a wonderful teacher and a wonderful physician."

Cindy Young is director of the medical school's Office of Marketing and Communications. She can be reached at cindy.young@wright.edu

### **Future Docs**

### The fast and the studious



**Comparing medical school to a marathon is only natural.** Both are prolonged, occasionally grueling endurance feats that demand focus, dedication, and sacrifice. And both are challenges that third-year medical student Josh Ordway eagerly embraces.

As one of the top marathon runners in the country, Ordway maintains an intense training schedule, often running twice a day and logging more than 100 miles per week. This regimen has helped him become an elite athlete—Ordway won the 2008 Columbus Marathon and qualified for the 2008 U.S. Olympic Trials, where he came in 21st—but keeping up this pace while attending medical school can be difficult.

"I refuse to get up before four [a.m.] to run," Ordway said, "because that's starting to get crazy. But if I can get up at four, I'm okay with that, and that will still allow me to get in the training I need."

After pounding the predawn pavement for five or six miles, Ordway puts in a full day of work for his clinical rotations before heading home for a harder workout of up to 13 miles. Medical school alone is extremely demanding, but Ordway doesn't mind pushing himself so hard athletically as well.

"Running keeps you mentally fresh," he explained. "It's a great stress reliever, and it helps you to focus and prioritize."

Running and school leave time for little else, but Ordway is also looking forward to getting married in July. Fortunately, his fiancée, Becki Michael, is handling the bulk of the wedding planning. Michael is very understanding about Ordway's busy schedule, because she's an elite marathoner herself: in 2008 she placed second in the Austin marathon and qualified for the U.S. Olympic Trials, just like her future husband.

In fact, distance running is an Ordway family tradition. Ordway's father, Doug, has been a runner for more than 40 years and is among the top marathon runners in Ohio in his age category. Ordway's two younger sisters both ran for their colleges, and his younger brother is currently running for Southern Illinois University. Ordway also ran as an undergraduate during his four years at Princeton University. The school recruited him based on his excellent academic record and his first-place finish in the Ohio high school cross country state championship race.

Despite running competitively since seventh grade, Ordway didn't attempt his first marathon until 2005, when he finished sixth in Columbus. Since then, he's taken his success, like the challenges of sustaining it, in stride.

"My goal is just to be a good med student and a good runner," he said. "Just to continue training at a high level, and if I can continually drop my time, if not race to race, then year to year, that'd be very nice."

#### <sup>6</sup> Running keeps you mentally fresh. It's a great stress reliever, and it helps you to focus and prioritize.<sup>99</sup>

After graduation, Ordway hopes to step up his training and possibly make another Olympic attempt in 2012. A residency, probably in family medicine, may also make training difficult, but he doesn't flinch at the idea.

"If you want something bad enough," he said, "if something's that important to you, you'll make yourself do it."

### **Future Docs**

### Radio Rounds gets around

As if they didn't already have enough to do, first-year students Lakshman Swamy and Avash Kalra decided to start a weekly radio show.

Their brain child, *Radio Rounds*, premiered Sunday, April 12, on WWSU 106.9 FM, Wright State's student-run radio station, and is distributed worldwide for download as a podcast on iTunes.

Geared towards current and aspiring med students and the health care community in general, *Radio Rounds* is a talk show produced entirely by medical students, the only such radio show in the country.

The eighth hour-long episode and season finale aired May 31. Each program features an in-depth interview with a medical professional conducted by Swamy and Kalra, as well as multiple guests (including faculty and students from the Boonshoft School of Medicine and other institutions nationwide), a pre-med segment, a Song of the Week, and a Case of the Week, which listeners can diagnose via email for the chance to win a prize. Following a summer hiatus, the program will resume on August 9.

Savvy in marketing and fully immersed in social media, Swamy and Kalra promote the program through Facebook (418 friends at last count—search for *Radio Rounds*), a Web site/blog (www.radiorounds.blogspot.com), iTunes (more than 4,000 downloads to date), and e-mail (radiorounds@gmail.com).



Avash Kalra (left) and Lakshman Swamy during a live broadcast of Radio Rounds.

*Vital Signs* turned the tables on the show's creators, Swamy and Kalra, with an e-mail interview about their experience. Here's what they had to say:

*Vital Signs:* What made you decide to do a radio show?

Kalra: I can promise that it wasn't because I like listening to the sound of my voice! When I was in undergrad, I was involved with journalism in various ways—mostly writing for newspapers and Web sites. I had very little experience with radio, but the opportunity presented itself to create a show.

Part of the culture of medicine involves medical students listening to and learning from mentors. So, we thought, why not do something like that on a weekly basis, but in a fun and engaging way? Our goal, really, has been to create a show that anyone either involved with the medical profession or interested in medical topics can find interesting. To that end, we've tried to feature a diverse array of themes—for instance, global health, organ transplants, cardiology, medical school admissions, women in medicine, and more.

**Swamy:** Early in the year, Avash came up with the idea. We thought it would be just for our class, a sort of audio newsletter. I think it was only after winter break, when we began training, that it slowly became more serious. By the time we aired our premiere show, we had already begun to realize the real potential that the show had created.

*VS:* What has been your greatest challenge in creating and hosting the radio show?

Kalra: There's quite a bit of pre- and post-production that goes into each episode, in addition to the time spent on advertising, creating and updating a Web site, making the show available on iTunes, and so on. At any given time, we're probably working on three to four episodes simultaneously. As far as actually hosting the show, though, I don't think that's been much of a challenge at all. I think Lakshman and I have great chemistry on the air and make a good team. We try to keep our bad jokes to a minimum.

**Swamy:** Without a doubt, there have been two main challenges. The first is learning how to use all of the equipment and keep a cool head during the shows. Each week, something new goes wrong, without fail. Last week, there was a baseball game on air that we didn't expect, and we had to do the whole show from the tiny recording studio in the back room. The room is essentially a storage room for the outdated equipment, but we somehow made it work.

The bigger challenge has definitely been finding time. When the show started, we were working week-to-week to contact and schedule guests, create themes, and put together the entire show. I put more time into the radio show than into school in those first few weeks, and it was incredibly hectic. We had no idea what we were getting into!

VS: What have you learned from this?

**Kalra:** I'd like to incorporate medical journalism into my career as a physician, and creating *Radio Rounds* has really helped me learn about some of the intricacies involved with that goal. Communication is an important aspect of medicine, particularly in terms of translating a complex topic into something that's more easily understandable for, say, a patient or the general public. The rest of the world is highly interested in our field, and we see that each week when we get e-mails from literally everywhere, from California to Egypt.

Swamy: I have learned so much about communication and media in the past few months. Even though this is a professional school, there is a big difference between talking to other students and professors I am close with compared to talking to physicians, politicians, and other high-profile figures I have never met before.

*VS:* How have you been able to get so many good guests on your program?

Kalra: To be honest, most of the time we simply have to ask, and the physicians we've talked to have been very warm and enthusiastic about the idea. *Radio Rounds* is unique, and our guests have the opportunity to speak to a wide audience. I think it helps generate some interest.

**Swamy:** Doctors seem to appreciate the idea of talking about medicine, creating a dialog about what makes the practice of health care so unique. This idea is one of the core visions of the project—to create a forum for the discussion of physician-hood itself. Moreover, the recent addition of a call-in system for our show helps enormously. It takes much less time and effort for guests to appear on the show, and they feel more relaxed.

*VS:* Do you do this alone or are other medical students involved?

**Kalra:** We're extremely fortunate to have a group of our classmates helping us with the show behind the scenes, and we cannot thank them enough. We've nicknamed them "The Medicine Cabinet," and we typically thank them by name at the end of our shows. Shamie Das is our executive producer, and he is as involved with the day-to-day production of the show as we are. If Lakshman and I are the hot-shot Hollywood actors, which is of course an absurd thought in and of itself, then Shamie is Steven Spielberg.

Other "Cabinet" members have helped with advertising the show and even with organizing full episodes. For example, Nicole Majoras, Michelle Kline, and Erika Manis essentially planned our entire "Women in Medicine" Mother's Day Special several weeks ago, along with the American Medical Women's Association (AMWA) chapter here at Wright State.

Swamy: Shamie's contributions are invaluable, to say the least. He takes care of the nuts and bolts of the show, especially on Sunday. More than all of that, though, Shamie is our more rational-minded sounding board. Avash and I sometimes get a little carried away with our ideas for the show, and Shamie keeps us in line and makes sure every episode is professional and interesting.

*VS:* Is there anything else you'd like to mention?

Kalra: Season two premieres August 9, 2009. The second season of *Radio Rounds* will be even bigger and better, with new interactive segments, live global health reporting, a great lineup of guests, and even a newly composed theme song.

Swamy: We have a lot of ideas for the next season, and we have some exciting guests already lined up! Please contact us at RadioRounds@gmail.com if you have any ideas or comments about the show, and especially if you are interested in appearing on our program. We would love to hear from more WSU alumni!

### **Future Docs**

# **Experience in India strengthens student's dedication to service**

Improving health care delivery systems and addressing broad public health issues are noble goals, but fulfilling them requires a sharp eye for opportunities and the initiative to pursue them. Case in point: Luke Rothermel, a fourth-year student in the M.D./M.P.H. dual-degree program.

Rothermel entered the program with a strong desire to make a difference, both by caring for individuals and enhancing the quality of care for entire patient populations. He had completed medical service missions to Mexico and Honduras as an undergraduate, and midway through his fourth year of medical school, he was eager to apply his training with another experience abroad, preferably in a rural area in a developing country.

He found his opportunity, of all places, during a theater production in Dayton.

<sup>11</sup>I have so many relationships from this trip, people I would never have met otherwise and who have really enriched me in incredible ways.<sup>99</sup>

> Flipping through the playbill, he discovered a note about a patron with a familiar name: Rajesh K. Soin. The note mentioned that the renowned business leader, former university trustee, and benefactor of the WSU Raj Soin College of Business, had recently completed the



construction of a new hospital in India in the agricultural state of Haryana.

Intrigued by the coincidence, Rothermel contacted Soin to learn more about the hospital. Soin appreciated Rothermel's interest and offered to sponsor him for a five-week trip to study public health conditions and serve alongside medical personnel at the Sukhdev Raj Soin Hospital, named after Soin's late father.

From the moment he arrived in India, Rothermel said, "everything was beyond expectations."

The teeming crowds and ceaseless activity of New Delhi, the need among farmers and villagers living near the remote hospital, and the dedication of the medical professionals striving to meet that need made an immediate and unforgettable impression. Perhaps most striking, though, was the warmth and enthusiasm Rothermel encountered at every turn.

"The hospitality of the people is overwhelming," Rothermel said. "To walk into a place and be regarded so highly, knowing that I'm not really bringing much, especially compared to what they're bringing each other," was deeply moving.

He was a guest at countless meals, several weddings, and the vibrant, three-day festival of Holi, which essentially shut down the hospital and most of the surrounding region. Notably, he was welcomed with such zeal not because he was a foreigner, a physician in training, or even a volunteer, but simply due to his honored status as a guest.

"This is the culture," he explained. "This is how people care for one another in rural India."

Despite their infectious joy and community spirit, however, local residents also struggle with serious challenges, including significant barriers to adequate health care.

Even so, Rothermel said, "the doctors who have committed to work there, the staff who are working there, and the purpose upon which the hospital was established really transcend the challenges."

He found his temporary colleagues' ability to make a difference for patients, and whole communities, both inspiring and humbling. "I don't know if I can do what they do," he admitted. "It's just such a large undertaking. But without a doubt, I want to emulate these people and work in a setting that offers better care to people who don't have many options."

In fact, Rothermel is already encouraging his fellow students to join him for a return trip in the coming year.

"My hope would be to bring other medical students and build a relationship with the hospital," he said. He would like to establish an enduring connection "for the sake of training students, and also to bring public health and medical initiatives to support the hospital."

Beyond any educational or service opportunities, though, Rothermel knows the most powerful and lasting impact of such an experience will likely be personal.

"I have so many relationships from this trip," he said, "people I would never have met otherwise and who have really enriched me in incredible ways."



In addition to working and learning at the Sukhdev Raj Soin Hospital in India's Haryana state, Luke Rothermel had many opportunities to enjoy the "overwhelming" hospitality of his hosts and experience local customs and culture.

### **Future Docs**

### **Student organizes regional meeting, wins national award**

When he becomes a physician, second-year student George Salloum plans to be involved with academic medicine and community outreach programs throughout his career. According to the American Medical Association (AMA) Foundation, he's already off to a great start.

At the foundation's annual Excellence in Medicine Awards ceremony, held in Washington, D.C., on March 9, Salloum received a 2009 Leadership Award in recognition of his outstanding non-clinical leadership skills in advocacy, community service, and education. One of just 15 medical students nationwide selected for the award, Salloum is the only recipient from Ohio. The award, presented in association with Pfizer Inc., provides honorees with special training to develop their skills as future leaders in organized medicine and community affairs.

Salloum is also a leader in the AMA Medical Student Section (MSS), serving as vice chair for Region 5. In this role, Salloum was instrumental in bringing the region's 2009 annual meeting to Dayton at the end of February.



George Salloum, center, receives his award from Nancy Nielsen, M.D., Ph.D., president of the American Medical Association, and Jack Watters, M.D., vice president of external medical affairs for Pfizer Inc.

Entitled "Together Towards Tomorrow," the meeting brought together representatives from medical schools in five states for three days of meetings, presentations, networking, and community service on the Wright State campus.

### M.D./M.B.A. research in Asia, South America

Opportunities to engage in research or to learn and serve abroad abound at the medical school. For students who hope to do both at once, a Research Travel Scholarship may be a perfect fit.

The scholarships, sponsored by the Global Health Systems Program within the Center for Global Health Systems, Management, and Policy, are awarded annually to support students interested in conducting international health systems research, primarily in developed countries.

At a faculty symposium hosted by the center on December 2, 2008, two scholarship recipients in the M.D./M.B.A. program presented the results of their research. Rocky Jedick performed a cost-effectiveness analysis of a workplacebased smoking cessation program in Japan, while Mark Ryan traveled to Venezuela to measure medication adherence among hypertensive patients in the country's new public health care system.

The presentations were well received, and

in 2009, both students went on to present their research at the national M.D./M.B.A. conference hosted by Wright State in April. Just over a month later, they completed



their studies and participated in the school's commencement ceremony. Following graduation, Jedick began a transitional year at David Grant Medical Center on Travis Air Force Base in

California, while Ryan became an internal medicine resident at Beth Israel Medical Center in New York City.**VS** 



Students Mark Ryan (left) and Rocky Jedick (above) present the results of their research into health systems in Venezuela and Japan, respectively.

#### Student research on display at spring event

Like their role models among the faculty, many students at the medical school are actively engaged in research, and a special event this spring shone a spotlight on their efforts. The first annual Medical Student Research Symposium, held on May 1 in White Hall on campus, gave 13 students the opportunity to present their research to an audience of peers, residents, faculty, and community members.

The event was organized by the Medical Student Research Club and hosted by the club and the school's Office of Research Affairs. In addition to discussing their work informally and fielding questions from attendees, the students participated in a poster competition with prizes for the top clinical and basic science posters, case presentation, and study design and method. Four faculty members judged the competition, and prizes were donated by several of the school's departments.

The opportunity to showcase outstanding work and support student research made everyone associated with the event a winner, but several students were also recognized for individual excellence:

Katie Bullinger, Best Overall Poster and Best Presentation

Kevin Kelley, Best Basic Science Poster

Adam Deardorf, Runner-Up, Basic Science Poster

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Ann Imber, Runner-Up, Basic Science Poster

Donald Gronbeck, Best Clinical Poster

Alyssa Gans, Runner-Up, Clinical Poster

Nathan Weir, Best Design and Method

Melanie Raffoul, Best Case Presentation

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Soybean LOX A542G Symposium organizer and Research Club president Jessica Hoying (far left) stands beside winning researchers (standing, I to r) Katie Bullinger, Kevin Kelley, Adam Deardorf, (seated, I to r) Nathan Weir, Melanie Raffoul, Donald Gronbeck, and Ann Imber. Alyssa Gans (not pictured) was also a winner.

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> (above) Ann Imber discusses her award-winning poster with competition judge Mark Rich, M.D., Ph.D. (below) Adam Deardorff describes his research to Mariana Morris, Ph.D.



med.wright.edu

### Milestones

# **Match Day**

On Thursday, March 19, the 97 members of the Boonshoft School of Medicine Class of 2009 joined nearly 30,000 other applicants in the largest Match Day in history. Wright State students matched in outstanding

Prasad Acharya Psychiatry Duke University Medical Center Durham, NC

Tyler Angelos Plastic Surgery Ohio State University Medical Center Columbus. OH

Meredith Angner Anesthesiology Indiana University School of Medicine Indianapolis, IN

Matthew Armstrong Emergency Medicine University of Pittsburgh Medical Center Pittsburgh, PA

Robert Armstrong General Surgery University Hospitals Case Medical Center Cleveland, OH

Hima Bindu Avutu Radiology-Diagnostic Dartmouth-Hitchcock Medical Center Lebanon, NH

Rania Awaad Psychiatry Stanford University School of Medicine Palo Alto, CA

Andrew Balk Emergency Medicine New York Methodist Hospital Brooklyn, NY

Amy Banks General Surgery Grand Rapids Medical Education Grand Rapids, MI

Adrian Baudy, IV Internal Medicine Tulane University School of Medicine New Orleans, LA

Susannah Becker Internal Medicine Ohio State University Medical Center Columbus, OH

Laura Bedrossian Internal Medicine Kettering Medical Center Kettering, OH programs in Dayton, throughout Ohio, and across the country. Nearly 56 percent will remain in Ohio during residency, and 44 percent will enter a primary care field such as family medicine, internal medicine, or pediatrics.

Hiloni Bhavsar Internal Medicine University Hospitals Case Medical Center Cleveland, OH

Deepa Bhupali Neurology Einstein/Montefiore Medical Center Bronx, NY

Riva Branch Obstetrics/Gynecology Advocate Illinois Masonic Medical Center Chicago, IL

**Meghan Brewster** Family Medicine Miami Valley Hospital Dayton, OH

April Bunn Pediatrics WSU Boonshoft School of Medicine Dayton, OH

Tiffany Burneka Emergency Medicine Akron General Medical Center/NEOUCOM Akron, OH

Nicole Carignan Anesthesiology Emory University School of Medicine Atlanta, GA

Rachel Cash Psychiatry WSU Boonshoft School of Medicine Dayton, OH

Jonathan Chae Orthopaedic Surgery University of Kentucky Medical Center Lexington, KY

Elizabeth Chmelik Psychiatry Rush University Medical Center Chicago, IL

Douglas Closser Internal Medicine Ohio State University Medical Center Columbus, OH

Susan Conrad Pediatrics Indiana University School of Medicine Indianapolis, IN

Elizabeth Davis Internal Medicine University of Michigan Hospitals Ann Arbor, MI



Beth Dektas Obstetrics/Gynecology Good Samaritan Hospital Cincinnati, OH

Andrew Diller Family Medicine WSU Boonshoft School of Medicine Dayton, OH

Graham Dondlinger Internal Medicine Johns Hopkins University/Sinai Hospital Baltimore, MD

Justin Drummond Anesthesiology Emory University School of Medicine Atlanta, GA

John Dundon General Surgery WSU Boonshoft School of Medicine Dayton, OH

Suzanne Lebida Dundon Internal Medicine WSU Boonshoft School of Medicine Dayton, OH

Danielle Erney Pediatrics Indiana University School of Medicine Indianapolis, IN

Christel Frantz Pediatrics Cincinnati Children's Hospital Medical Center Cincinnati, OH

Larry Gaines General Surgery St. Joseph Mercy-Oakland Pontiac, MI

Rishi Gandhi Internal Medicine Case Western Reserve University/ MetroHealth Medical Center Cleveland, OH

Alyssa Gans General Surgery WSU Boonshoft School of Medicine Dayton, OH

Donald Gronbeck General Surgery WSU Boonshoft School of Medicine Dayton, OH

Brandi Hartley Orthopaedic Surgery University of Louisville School of Medicine Louisville, KY

Brad Haverkos, M.P.H. Internal Medicine University of Illinois College of Medicine Chicago, IL

Linda Hinkelman Emergency Medicine WSU Boonshoft School of Medicine Dayton, OH

Dawn Hochstettler Obstetrics/Gynecology Akron General Medical Center/NEOUCOM Akron, OH

Daniel Hosta General Surgery WSU Boonshoft School of Medicine Dayton, OH

Michelle Broestl Hosta Emergency Medicine WSU Boonshoft School of Medicine Dayton, OH





Dana Mollicone Internal Medicine University Hospitals Case Medical Center Cleveland, OH

Sonal Moratschek Psychiatry University Hospitals Case Medical Center Cleveland, OH

David Morris Pediatrics WSU Boonshoft School of Medicine Dayton, OH

Anna Murley Family Medicine Grant Medical Center Columbus, OH

Benjamin Newman Emergency Medicine University of Rochester/Strong Memorial Hospital Rochester, NY

Sylvia Ofei Pediatrics Nationwide Children's Hospital Columbus, OH

Scott Oosting Internal Medicine St. Vincent Hospital and Healthcare Center Indianapolis, IN

Shiao-Pei Pan Neurology University of Michigan Hospitals Ann Arbor, MI

Aaron Patterson, M.B.A. Psychiatry Beth Israel Medical Center New York, NY

Matthew Pellerite, M.P.H. Pediatrics University of Chicago Medical Center Chicago, IL

**Ersie Pouagare** Pathology Tufts Medical Center Boston, MA

Benjamin Radcliffe General Surgery Riverside Methodist Hospital Columbus, OH

Katherine Radcliffe Family Medicine Grant Medical Center Columbus, OH

Christopher Redman Orthopaedic Surgery Allegheny General Hospital Pittsburgh, PA

Irving Rosenberg Internal Medicine Ohio State University Medical Center Columbus, OH

Laura Rust Pediatrics Nationwide Children's Hospital Columbus, OH

Timothy Rust Neurology Ohio State University Medical Center Columbus, OH

Mark Ryan, M.B.A. Internal Medicine Beth Israel Medical Center New York, NY



Timothy Savage Pediatrics WSU Boonshoft School of Medicine Davton. OH

Shannon Schwartz General Surgery Georgetown University Hospital Washington, DC

**Tiffani Shippe** Family Medicine Trident Medical Center Charleston, SC

**Coral Spicer** Obstetrics/Gynecology Good Samaritan and Bethesda North Hospitals Cincinnati, OH

**Courtney Stroble** Transitional Year Riverside Methodist Hospital Columbus, OH

Meredith Sullivan Pediatrics WSU Boonshoft School of Medicine Dayton, OH

Katherine Wehri Takayasu, M.B.A. Family Medicine New York Presbyterian-Columbia University Medical Center New York, NY

**Gregory Thompson** Radiation Oncology University Hospital Cincinnati, OH

Michelle Treasure Internal Medicine University Hospitals Case Medical Center Cleveland, OH

Jennifer Turle Pediatrics University Hospitals Case Medical Center Cleveland, OH

Aaron Vaughan Family Medicine University of Virginia Charlottesville, VA

Jessica Vinsant, M.B.A. General Surgery East Tennessee State University Johnson City, TN

Bret Weathers Emergency Medicine Wayne State University/Detroit Medical Center Detroit, MI

Alicia Weeks Family Medicine St. Elizabeth Medical Center Edgewood, KY

Kirk Whetstone Physical Medicine & Rehabilitation University of Washington Affiliated Hospitals Seattle, WA

Lena Wiley Obstetrics/Gynecology University Hospitals Case Medical Center Cleveland, OH

Lena Winkler Family Medicine Ohio State University Medical Center Columbus, OH

Katherine Winner Psychiatry WSU Boonshoft School of Medicine Dayton, OH

#### Radiology-Diagnostic University of Colorado School of Medicine Aurora, CO

Seethal Jacob Pediatrics Indiana University School of Medicine Indianapolis, IN

Rocky Jedick, M.B.A. Transitional Year David Grant Medical Center Travis Air Force Base, CA

**Brian Imbrogno** 

Amy Jeffers Pediatrics Loyola University Medical Center Maywood, IL

Franciska Kiraly Internal Medicine Summa Health/NEOUCOM Akron, OH

Kirsten Kolodzik Kusumi Pediatrics Nationwide Children's Hospital Columbus, OH

Celina Labrec-Salmons Internal Medicine/Pediatrics WSU Boonshoft School of Medicine Dayton, OH

Scott Leffler Anesthesiology University Hospitals Case Medical Center Cleveland, OH

Adam Lenger Radiology-Diagnostic Oakwood Hospital Dearborn, MI

Ellen Little Family Medicine Riverside Methodist Hospital Columbus, OH

James Lyions Orthopaedic Surgery University of Toledo Toledo, OH

Benjamin Mack Emergency Medicine WSU Boonshoft School of Medicine Dayton, OH

Andrew Maley General Surgery Western Reserve Care System/NEOUCOM Youngstown, OH

Justin Mandell Plastic Surgery University of Nevada Affiliated Hospitals Las Vegas, NV

Jaime Marks Family Medicine Mount Carmel Health System Columbus, OH

Matthew McCutcheon Internal Medicine Ohio State University Medical Center Columbus, OH

Samar Zeidan McCutcheon Psychiatry Ohio State University Medical Center Columbus, OH

Jennifer Mitzman Emergency Medicine University Hospitals Case Medical Center Cleveland, OH

### Milestones



# Graduation

After four or more years of intense work and specialized training, the 97 members of the Boonshoft School of Medicine Class of 2009 officially became physicians on May 22. During a commencement ceremony held in the Schuster Performing Arts Center in downtown Dayton, the graduates received their M.D. degrees, participated in the traditional "hooding ceremony," took a professional oath to mark the start of their medical careers, and signed a registry to commemorate their first use of the initials "M.D." following their names.

Following remarks by WSU President David R. Hopkins, P.E.D.; Dean Howard M. Part, M.D.; and Laura O. Rust, president of the class of 2009, the graduates and their guests enjoyed a commencement address delivered by Barbara Lee Bass, M.D., FACS, the John F. and Carolyn Bookout Distinguished Endowed Chair of Surgery at The Methodist Hospital in Houston, Texas. In addition to the degrees, several special awards and honors were presented during the ceremony:

#### Appreciation Award—

Academy of Medicine

#### Dean's Award—

Tyler M. Angelos

For commitment to academic excellence, empathy and compassion toward others, personal integrity and professionalism, and earning the respect and trust of classmates and faculty.

Arnold P. Gold Foundation's Leonard Tow Humanism in Medicine Award— Matthew M. Pellerite, M.P.H., (student) and S. Bruce Binder, M.D., Ph.D., Associate Professor of Family Medicine and Assistant Professor of Pharmacology and Toxicology (faculty)

For outstanding compassion in the delivery of care; respect for patients, their families and health care colleagues; and demonstrated clinical excellence.

#### Teaching Excellence Award—

W. Scott Richardson, M.D., Professor of Internal Medicine For outstanding professional skill and pride in discharging his instructional duties.











### On the Move

#### James R. Ebert, M.D., M.B.A., M.P.H., FAAP Oscar Boonshoft Chair and Director, Center for Global Health Systems, Management, and Policy

James R. Ebert, M.D., M.B.A., M.P.H., FAAP, has been affiliated with the medical school since 1987 and joined the faculty full-time in 2004 as an associate professor of community health and pediatrics, founding director of the Boonshoft Physician Leadership Development Program, and director of the public health management concentration in the Master of Public Health program. Ebert was affiliated with Wright-Patterson Medical Center for 15 years as well, most recently as commander of medical operations, chief of medical staff, and director of medical education. He is also an active staff member with the Cincinnati Children's Hospital Medical Center and is lead physician with the Dayton Children's Medical Center Lipid Clinic. A member of Phi Beta Kappa, Ebert holds a B.A. in economics from The Ohio State University, an M.D. from the University of Cincinnati College of Medicine, an M.B.A. from Wright State's Raj Soin College of Business, and an M.P.H. from Wright State. He is board certified in pediatrics and adolescent medicine, and is a fellow and past chapter president of the American Academy of Pediatrics.



#### **Richard J. Sherwood, Ph.D.** Director, Lifespan Health Research Center

Richard J. Sherwood, Ph.D., came to the Lifespan Health Research Center in 2003 as a visiting scientist from the anthropology department of the University of Wisconsin, Madison, and joined the center as a full-time faculty member two years later. An accomplished teacher, prolific writer, and passionate researcher, Sherwood has conducted research in Nepal, Pakistan, Kenya, and Tanzania, and his current research includes three R01 grants from the National Institutes of Health. Sherwood is a member of 10 scientific and professional associations and serves as president of the American Association of Anthropological Genetics and the Society of Craniofacial Genetics. He is a reviewer for several publishers, granting agencies, and journals, including the National Science Foundation, the National Environmental Research Council, *Current Anthropology*, and *Science*. Sherwood earned his Ph.D. in biomedical sciences and an M.A. in anthropology from Kent State University and a B.A. in anthropology from the University of California, Berkeley.





#### Kevin J. Watt, M.D. Assistant Dean, Student Affairs and Admissions Office of Diversity and Inclusion

Kevin J. Watt, M.D. ('95), is both an alumnus of the medical school and a former faculty member. Watt served as chief resident in the ophthalmology residency program of Akron City Hospitals/Summa Health System before returning to Wright State in 1999 as a clinical instructor of ophthalmology. He left the university in 2002 for a teaching position with Faith Regional Health Services in Norfolk, Nebraska, where he also served as the ophthalmology rotation director for the University of Nebraska Medical Center Rural Residency program. In addition to his work with the Office of Student Affairs and Admissions and the medical school admissions committee, Watt participates in a private group ophthalmology practice in Dayton. Before earning his medical degree, Watt received a B.S. from Morehouse College in Atlanta and completed a postbaccalaureate program at the Southern Illinois University School of Medicine.

### In Good Company

# Reaching for the Stars: Michael Barratt's chance to walk the (space)walk



Physicians tend to be passionate about their profession, but Michael Barratt, M.D., has taken efforts to master his specialty to new heights. A 1991 graduate of the medical school's Aerospace Medicine Residency Program, Barratt has become his own research subject in an orbiting laboratory nearly 200 miles above the Earth.

On March 26, Barratt, who is now a NASA astronaut, lifted off from the Baikonur Cosmodrome in Kazakhstan aboard a Russian Soyuz TMA-14 spacecraft bound for the International Space Station (ISS). As a flight engineer for ISS Expeditions 19 and 20, Barratt will remain on the station for nearly six months, with a planned return to Earth on October 11.

"As a space medicine specialist," Barratt said, "I spent long years studying space medicine, teaching it to various people including to astronauts who were about to fly. I'm formally trained, obviously, starting at Wright State and finishing at NASA, but to get this experience to add to that formal training, I think, is really going to be great. That's one of the big things I'm looking forward to."

During his time on the ISS, Barratt will oversee many science investigations, contribute

to daily station operations, and conduct two spacewalks to prepare for the addition of a new Russian docking module. According to NASA, during Expedition 20 the station will be visited by the Space Shuttle twice, by two Russian Progress resupply vehicles, and by a new cargo ship, the Japanese H-II Transfer Vehicle (HTV-1).

### Wright State—Launch pad for a stellar career

Unlike many astronauts, Barratt hasn't cherished the thought of space travel as a lifelong dream. A passion for science led him to earn a B.S. in zoology from the University of Washington, where he met and married his wife, Michelle. The couple would eventually settle in Houston and have five children (now between the ages of 8 and 20), but first they moved to Chicago, where both enrolled in medical school. After earning his M.D. from Northwestern University, Barratt became an internal medicine resident at Northwestern before serving as chief resident at Veterans Administration Lakeside Hospital.

Toward the end of his time in Chicago, Barratt's conversations with the Aerospace Medicine Residency Program director at Wright State, "really got me hooked on the whole space medicine thing," he said. "It's just the most interesting thing I can think of. It's brand-new physiology. It's research. It's operational. It's amazing."

While a resident with the program, Barratt conducted research on human performance through underwater testing of a new concept for an EVA (Extra-Vehicular Activity) enclosure.

"For not being at NASA at the time," Barratt said, "I had an incredible capability, between Wright State and Wright-Patterson Air Force Base, to study this, and the data was useful at JSC (Johnson Space Center) as well.

"That's one of the great things about Wright State. People are used to doing that kind of stuff, and with Wright-Patterson there, they're all about optimizing human performance in strange environments like flight environments, so it was not that difficult to do."

"The academic background that I got at Wright State was a huge thing," Barratt added. "That just makes a big difference."

### In Good Company

Many of Barratt's fellow graduates are now playing important roles in space programs around the world, and he remains in contact with several as both friends and colleagues. During his mission, he is collaborating with a program graduate based in Brazil, and two others attended his launch. Ed Powers, M.D., one of Barratt's closest

I spent long years studying space medicine, teaching it to various people—including to astronauts who were about to fly. I'm formally trained, obviously, starting at Wright State and finishing at NASA, but to get this experience to add to that formal training, I think, is really going to be great. That's one of the big things I'm looking forward to.

> friends since they met as residents two decades ago, is serving as NASA's flight surgeon for Expeditions 19 and 20.

Even 20 years after entering the program, Barratt said, "It's a pretty tight community that came out of that residency group."

### From Dayton to Moscow via Houston

After completing his aerospace medicine residency, Barratt worked for NASA at the JSC in Houston on the Space Station Freedom project. Two years later, in 1993, he became one of the first Americans to attend the landing of a Soyuz spacecraft, and he spent the next several years supporting the new joint U.S./Russian Shuttle-Mir project. Barratt considers his involvement in bringing together the two space programs "one of the most exciting things I've ever done."

"Space medicine is kind of a small field anyway," he said. "Then, all of a sudden, we got this new set of colleagues that we didn't have access to at all before. So the community more than doubled in size. That was just an incredible pleasure."

In a similar way, Barratt has enjoyed seeing the international space program grow and connect people and organizations around the globe. In fact, his mission will be the first to include representatives from all five partner agencies of the ISS: the U.S., Russia, Canada, Europe, and Japan. Expedition 20, which began with the arrival of three new crew members in late May, also marked the first time the station became home to a full, six-person crew.

"To me, that's incredible," Barratt said. "I drew the long straw on this one. Going to a six-person crew is a really big thing. It's how we're going to get the productivity out of the station that it was really designed to support."

#### A long countdown to liftoff

Barratt's work with the Shuttle-Mir program inspired him to give the idea of becoming an astronaut a little more thought, again driven by an abiding fascination with the medical aspects of spaceflight. To live and work on a space station, Barratt said, "you're looking at full adaptation to zero-G. If you look at the big scheme of human spaceflight, we want to go to Mars, and we want to go a lot further, and it's going to involve a long period in zero gravity. It's essentially how we're going to get somewhere outside of low Earth orbit."

Even as he considered this new path, Barratt served as medical operations lead for the ISS from 1995 to 1998. He then acted as lead crew surgeon for the first expedition crew until he was selected, along with 16 other candidates, as a member of the NASA Astronaut Class of 2000.

After beginning his astronaut training, Barratt would have to wait nearly nine years for his first chance to travel into space. However, the delay didn't bother him a bit.

"I'm sort of taking the longest route up there," he admitted, "but in turn I get, I think, the best mission, because it's good and long. I have piloting duties, I have EVA duties. I have robotics duties. For all the time I've waited, I've actually trained in most everything that makes space flight really interesting, so I have no problem with the time it took."

#### A bright future for spaceflight and humanity

Taking the long view has also helped Barratt to take the inevitable challenges in stride—including the occasional global crisis, such as the current economic turmoil. After all, he points out, the field of space exploration has weathered worse difficulties over the years. When he arrived in Russia in 1993, Barratt said, "there was no food on the shelves, and my colleagues hadn't been paid for months. It was like that for quite a while, for at least a couple of years. These guys went for months at a time just kind of living on home-grown produce and the barter system, and yet they kept their space station afloat. It was the pride, and it was just their lives. It was the right thing to do.

"A couple of weeks after I left here once" during those early years, he added, "there were tanks on the bridge over the Moscow River, shelling the White House (a Russian government building). We built that whole [Shuttle-Mir] program in circumstances much, much worse than now."

The space program will and should remain a priority, Barratt also feels, because "it is an international program with an incredibly positive agenda."

In terms of the full scope of human history, he added, "expanding off the planet, that's an absolute eventuality. Economic crises and political events might delay things or accelerate things by a few years here and there, but in the big scheme of things, they're really tiny blips on a great big curve.

"I have no doubt we'll be going [back] to the moon and further," Barratt said, "and it's just a matter of when."

Barratt's home away from home for six months: the International Space Station, orbiting the planet at an altitude of nearly 200 miles. Photo courtesy of NASA

### In Good Company

### Life on a platter: The unlikely journey of Susan Williams

#### Fortunately for Susan Williams, M.D. ('03), M.S., FACN, FACP, she's never been very good at math.

In the mid 1990s when Williams first considered applying to medical school, she already had a master's degree in food science and human nutrition and a successful career as a registered dietitian and nutrition consultant. Working with an advisor at Wright State, Williams added up the years of training she would need, from pre-med courses through residency, and realized that she would likely be 52 years old when she entered medical practice.

The prospect of more than a decade of intense work was daunting, but Williams' mother asked her, "Hopefully you're going to be 52 anyway someday, so what do you want to be doing by then?"

Heeding her mother's advice, Williams ignored the numbers and started taking pre-med courses at night, beginning with her weakest subject: math. She took a placement exam with a group of undergraduates in their late teens, which wasn't encouraging, because as one of her colleagues noted, "her score was closer to their age, and their score was closer to her age."

Nevertheless, Williams enrolled in a basic math class, passed, and then signed up for another. Over the course of four years, she worked her way up through precalculus; took biology, chemistry, and other core subjects; did well on the MCAT exam; and applied to Wright State's medical school.

### From the battlefield to basic (medical) training

By late July of 1999, Williams was on the wait list for Wright State, and her status seemed unlikely to change. An avid photographer with a special interest in Civil War battlefields, Williams left with her husband for a weekend bus trip to tour historic sites around Chattanooga, Tennessee. When they arrived at their hotel, a voicemail message was waiting for them. Williams had made it off the wait list and was welcome to join the class of 2003.

She was elated by the news, but confounded by logistical challenges. The fact that she was stuck hundreds of miles from Dayton the day before convocation was only the most immediate problem. She was also still employed full-time, and as the only licensed dietitian in her building, she couldn't walk away on a moment's notice.

Williams managed to make it home and join her class when orientation began early Monday morning. She transitioned out of her job over the next two months and dedicated herself wholly to medical school.

"I'm amazed I pulled it off," she said, "although I rapidly learned that sleep was optional." Williams soon connected with a likeminded study partner, a woman with an established career and a Ph.D. in clinical psychology, as well as a dozen or so other students in their 30s or older.

"We worked very hard to learn the material," she said, "to keep our heads above the high-water mark and support one another through the very challenging program. We really gained strength from one another."

Midway through her second year of medical school, Williams hit a low point. She was working harder than ever, had little time for anything outside of school, and wondered why she'd walked away from a stable job with steady hours, no weekend obligations, and a nice salary.

Again, she found support within her own demographic, but this time among faculty members who could relate to her struggle and reassure her of the rewards that lay ahead.

"They were instrumental in guiding me," she said. "Guiding my energy, guiding my thoughts, and saying, 'No, you're not in your 20s. You're in your 40s. But this is where the payoff is going to be as you move forward."

### Confidence, clinicals, connections

When she began clinical rotations in her third year, Williams said, "I felt like I could make it. I remembered why I was there in the first place." Being in a familiar environment, working with patients again, and even applying her expertise in nutrition, "just kind of breathed life back into me."

"In the depths of that second year," she said, "I was wondering if I was ever going to feel accomplished again, to feel that I was going to hold my own as a professional."

Some of her professors nurtured her sense of confidence by asking her to consult with patients facing tricky nutrition issues or to serve as a guest lecturer on topics in her field. Sustained by these opportunities and reenergized by her work in the various clinics and hospitals, Williams made it through her final two years and graduated in 2003.

She applied for residencies in internal medicine in hopes of building on her previous career.

"Somehow, I didn't want to lose that nutrition background," she said.

During her residency at Kettering Medical Center, she completed two rotations at the Cleveland Clinic. She enjoyed the experience so much that she applied for—and was accepted into—a fellowship in clinical nutrition there. The program began the day after her residency concluded, but unlike with medical school, Williams had plenty of notice and could plan ahead for a smooth, albeit quick, transition.

#### **Bringing everything together**

As a fellow, Williams divided her time between work in gastroenterology and endocrinology, which, she said, "turned out to be the perfect combination."

Gastroenterology allowed her to learn about malabsorption, disease processes such as Crohn's and ulcerative colitis, and supplements and other interventions to help rehabilitate patients. Endocrinology



Williams presented a poster on her research in metabolic bone disease at an international conference in 2008. An avid photographer, Williams enjoys capturing images of Civil War sites and Ohio wildlife, among other subjects.

gave her a better understanding of metabolism, including cellular activity, medications, and the impact of conditions such as diabetes, thyroid disease, or adrenal disease.

In addition to her regular rotations, Williams was required to sign up for an afternoon in the metabolic bone center, an assignment most fellows accepted reluctantly.

In contrast, Williams said, "about two hours into my first osteoporosis clinic, you couldn't have torn me away."

"Studying metabolic bone disease took nutrition, endocrinology, GI, and medicine," she explained. "It took

### In Good Company

everything and pulled it together for me, and that catapulted me into a career in metabolic medicine, with a subspecialty in metabolic bone disease."

After her fellowship, Williams declined a job offer from the Cleveland Clinic and returned to Dayton. She explored a number of possibilities and decided to open a practice, the Center for Nutrition and Metabolic Medicine, in connection with Greene Memorial Hospital.

Her office opened in January 2008, and Williams steadily built up the practice through referrals from former colleagues and by reaching out to other physicians.

#### I couldn't have designed it better. It's been an incredible journey. I am blessed beyond measure.

She works with patients with bone disease, thyroid or parathyroid disease, Crohn's disease, Celiac disease, and other conditions, as well as those who have undergone bariatric or other GI surgery.

"We really have been able to complement what primary care physicians have been able to do for their patients," Williams said, "and that's been extraordinarily rewarding."

Williams is also able to carve out time for research, an interest that she pursued as a resident and emphasized during her fellowship. She has published articles and book chapters, has presented at conferences including the international conference of the American Society of Bone and Mineral Research, and is currently pursuing funding for a longitudinal study on Vitamin D in collaboration with colleagues at the Cleveland Clinic.

#### Choosing the right platter

While Williams didn't plan her long, unlikely path to medical practice, she feels it led her to the perfect place.

"I couldn't have designed it better," she said. "It's been an incredible journey. I am blessed beyond measure."

As a volunteer faculty member with the medical school, Williams also has the opportunity to help medical students including non-traditional students like herself—with their own journeys.

Her advice to older students, and to anyone contemplating an ambitious challenge, is simple: "Don't judge what you can do by your age. Don't use that as an excuse." If you have an idea or a dream that keeps coming up, she said, you owe it to yourself—and to others who might share your interests—to explore the possibilities.

"If you look into it and decide, 'It's not for me,' okay," she said. "At least you looked."

Williams sums up her outlook with a metaphorical question that echoes her mother's pivotal advice at the start of her medical school journey.

Imagine you could look 10 years into the future, and "someone was coming to you with two beautiful silver platters," she said. "On one is a successful physician with a growing medical practice, providing state-of-the art care for patients. And on the other is a dietitian who's also successful, but capable of accomplishing so much more.

"Which platter would you choose?"



# **Alumni Notes**

We're proud of our alumni 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 contact the Office of Advancement at som\_adv@med.wright.edu or (937) 775-2972.

#### George Herman, M.D., and Parmie (Andaloro) Herman, M.D.

are both in family practice with St. Rita Medical Center in Lima, Ohio, and were each recertified by the American Board of Family Practice in 2007. In addition, Parmie earned specialty board certification in palliative care in 2009. The Hermans have two children, Elizabeth (20) and David (19), both of whom are attending Mount Union College in Alliance, Ohio.

#### Jeanette Abell, M.D., M.B.A.

joined Halley Consulting Group, LLC, a national practice management and consulting firm in Columbus, Ohio, in February. She is board certified in internal medicine, and prior to joining the firm, she held top leadership positions with multiple hospitalist programs and was the cocreator and president of Hospital Physicians of Ohio Inc.

#### Kevin McChord, M.D.

began specializing in varicose vein disease and minimally invasive treatments for it in 2008 following 14 years in family medicine. He practices at Vein Clinics of America in Cincinnati, and he and his wife, Amy, live in northern Kentucky with their four children: Anna (9), JT (8), Rachel (5), and Isabella (3).

#### Jeannie Hughes, M.D.

is a co-owner of Westerville Family Physicians Inc. in Westerville, Ohio. She and her husband, Brian Franz, have four children: Zach (10), Jacob (8), Benjamin (6), and Noah (4).

#### Jody Hutchinson Ross, M.D.

enjoys balancing clinical practice and teaching medical students and residents at the Penn State Hershey Medical Center Children's Hospital. She and her husband, Stephen, a neurologist, have four children: Corynne (16), Benjamin (12), Margaret (7), and Katherine (4).

#### Diane Sims Thompson, M.D.

is CEO of Dagney Health, LLC, in Telluride, Colorado, a firm that consults with hospitals to build cancer centers and women's centers, and to attain national accreditation. She is also the medical director for women's health and the program director for oncology at Queen's Medical Center in Honolulu, Hawaii. Her husband, Todd, is neurological surgeon.

**Barbara (Sarchet) Cooper, M.D.** is a part-time clinician-educator with the Walter Reed Army Medical Center in Washington, D.C. She and her husband, Patrick, who is a neurosurgeon, have two children: Megan (6) and Gavin (3).

#### Rebecca C. Rastetter, M.D.

is in private practice at Whitney Pediatric and Adolescent Medicine, P.C., in Hamden, Connecticut. She and husband, Jonathan Puchalski, M.D. ('98), have two children: Reese (6) and Corinne (4).

#### Tyler Hall, M.D.,

recently completed an ophthalmology residency and will begin a cornea fellowship in July. He and his wife, Alison, live in Birmingham, Alabama, and have two children: Avery (6) and Ian (5 months).

#### David L. Henderson, M.D.,

is co-author of the new book *Finding Purpose Beyond Our Pain: Uncover the Hidden Potential in Life's Most Common Struggles,* to be published by Thomas Nelson Inc. in September 2009. He co-wrote the book with Paul Meier, M.D., founder of the national Meier Clinics® practice, with locations in nine states. Dr. Henderson is a staff member with the Meier Clinic in Dallas and an adjunct professor of Biblical counseling at Dallas Theological Seminary. He and his wife, Angela, have two children, Christian and Victoria.

#### Elizabeth A. L. Muennich, M.D.

will join Mason Dermatology Associates, located north of Cincinnati, in September. She and her husband, Josh, have one son, Ethan (13 months).

#### Erin Owen, M.D.

is beginning her second year as a pediatric critical care medicine fellow with the University of Louisville Department of Pediatrics. She and her husband, Christopher, live in Louisville.

#### Jeremy Slone, M.D.

Recently completed a pediatrics residency in Phoenix and will begin a pediatric hematology-oncology fellowship at Vanderbilt University in Nashville, Tennessee.



3640 Col. Glenn Hwy., Dayton, OH 45435-0001

#### The science of slapstick: Medical school meets Vaudeville

Medical school students and faculty proved they can be good sports for a good cause as part of an unusual—and messy—fundraising event this spring. On April 3, students filled Gandhi Auditorium in White Hall for a sloppy spectacle far more entertaining than their typical lectures. They came to watch a teacher and a classmate take a pie to the face.

The willing victims of this premeditated pastry assault were Paul Koles, M.D., associate professor of pathology and surgery and director of pathology education, and T.J. Hufford, president of the class of 2012. The "winners" of a special election organized by first-year student Lorena Rodriguez and the WSU chapter of the Student National Medical



Association, Koles and Hufford received the most votes from students, faculty, and staff, who donated \$1 for every five votes over the course of three months.

Despite some questions about election irregularities—including a large, last-minute donation by Gary LeRoy, M.D., associate dean of student affairs and admissions, that gave Koles a substantial lead and knocked LeRoy back to third place—observers declared the election a rousing success. The event raised hundreds of dollars to support sickle cell anemia research. LeRoy volunteered to take a pie to the face along with Koles, and Hufford was so thoroughly coated with pie that, he said, "I could still taste it two days later."



