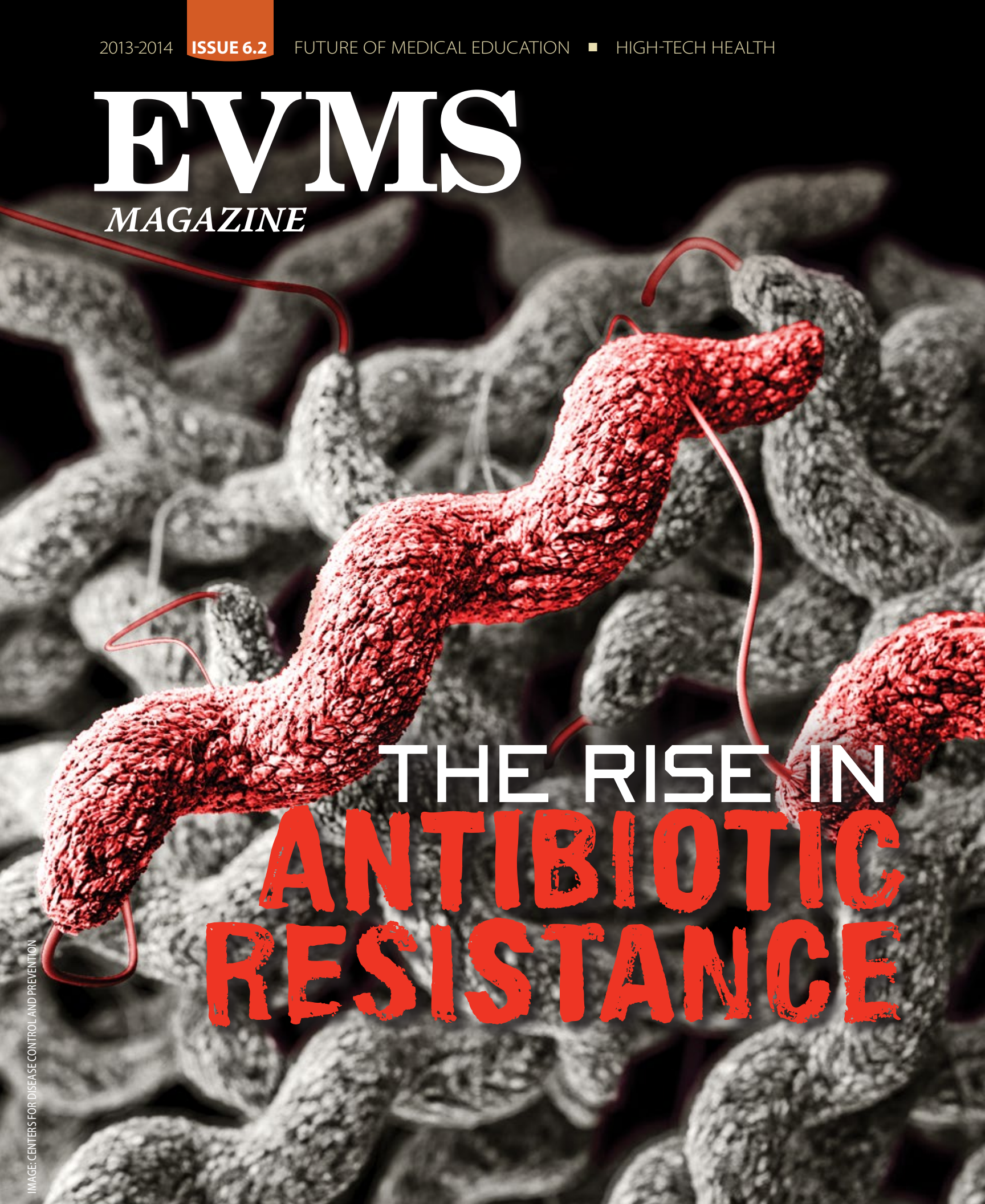
2013-2014 ISSUE 6.2 FUTURE OF MEDICAL EDUCATION ■ HIGH-TECH HEALTH

EVMS MAGAZINE



THE RISE IN ANTIBIOTIC RESISTANCE

IMAGE: CENTERS FOR DISEASE CONTROL AND PREVENTION

When you give, **they give.**

For every gift you make to the EVMS Fund through March 31, Liberty Tax Service will contribute another $40 — up to a total of $25,000. Meet the challenge and maximize your impact.

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upcoming events

April 28

Mike Cavish Golf Tournament & Dinner

There's still time to register your team or chose from a variety of sponsorship opportunities for this annual tournament at Elizabeth Manor Golf and Country Club in Portsmouth. Tournament proceeds benefit the EVMS Strelitz Diabetes Center. For details, call 757.446.6070 or visit *evms.edu/giving*.

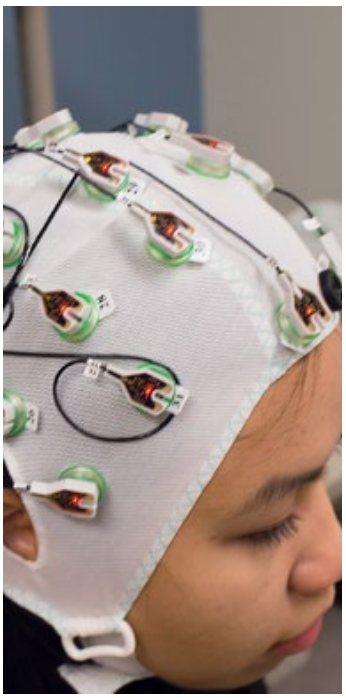
May 17

Commencement

The EVMS graduation ceremony begins at 10 a.m. at the Norfolk Scope. Related events, including the military commissioning ceremony, white coat ceremonies and receptions, precede the ceremony. For details, visit *evms.edu/commencement*.

New tools and technology will radically change medical education and clinical practice in the future.

Public health officials are speaking in apocalyptic terms to describe the threat of antibiotic resistance.



Advanced tools and techniques enhance diagnosis and treatment.

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Growing technology gives health-care providers an array of new tools to help catch problems early and treat patients with greater precision.

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OUR VISION: Eastern Virginia Medical School will be recognized as the most community-oriented school of medicine and health professions in the United States.

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EVMS Magazine is published four times a year, including a digital-only issue. Copies are available on campus, in doctors' offices and by mail. An electronic version is available online at www.evms.edu/magazine. To request a copy or share news, please contact Doug Gardner, News Director, 757.446.7070 or news@evms.edu.

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fromthePresident

Throughout our history, EVMS has pushed boundaries. We have a unique history stretching back to our earliest days as an idea sparked from members of this community. We have explored the frontiers of science and education for the past 40 years, and we continue to do so as the 21st century yields new theories and technologies that support our missions.

Take, for example, the changing concept of medical education. EVMS and other schools across the country are re-examining the training model that has been in place for more than 100 years and are incorporating new concepts, such as skills-based assessments and team learning, into our curriculum. You can get a more in-depth look at the future of medical education in the feature story on page 14.

In the realm of patient care, the future is now. EVMS clinicians are incorporating new technology — or are applying existing technology in new ways — to offer previously unheard-of levels of precision. Our story on page 24 highlights some of the devices that are changing the way we treat cancer, diabetes and infertility.

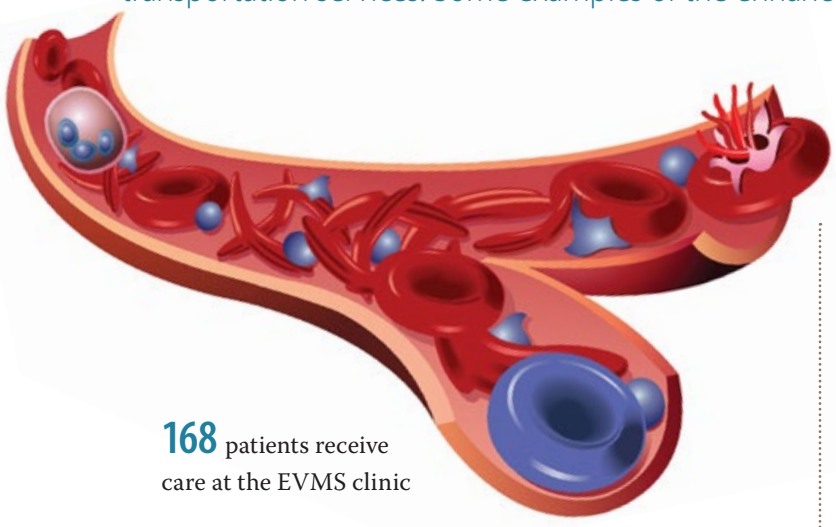
The future holds the exciting prospect of making advances that tangibly affect our community. There are challenges in the road ahead, such as the increased prevalence of antibiotic-resistant bacteria described in the article on page 18, but we have spent four decades meeting and overcoming obstacles. We will succeed over the next 40 years — and beyond — by staying true to the values of excellence, collegiality and integrity that have guided us from the beginning.

We appreciate the dedication you have shown EVMS since its inception and, with your continued support, we look forward to the journey ahead.

Sincerely,

Richard V. Homan, MD

The EVMS Sickle Cell Management Program cares for patients dealing with this devastating disease. With funding from the United Way of South Hampton Roads and Hampton Roads Community Foundation and hands-on support from the Urban League, the EVMS program has expanded to include counseling, psychological services, housing advice, employment and transportation services. Some examples of the enhanced care and the need:



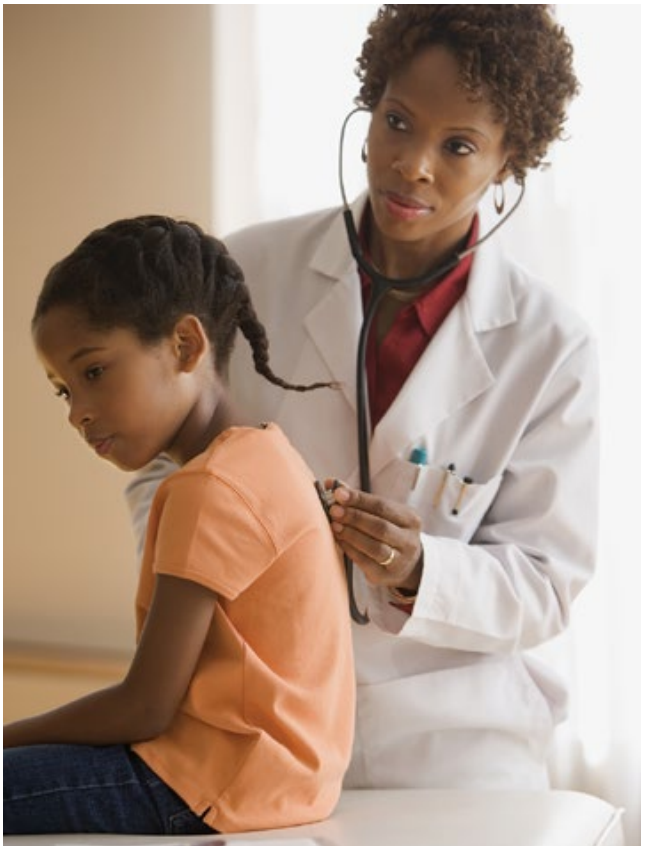
168 patients receive care at the EVMS clinic

30 percent reduction in pain management hospitalizations. That's the three-year target thanks in part to outside support

18 patients received counseling on buying a first home or renting

51 pediatric sickle cell patients now at CHKD will become eligible for adult care in two years

45 patients have received job assistance through the Urban League

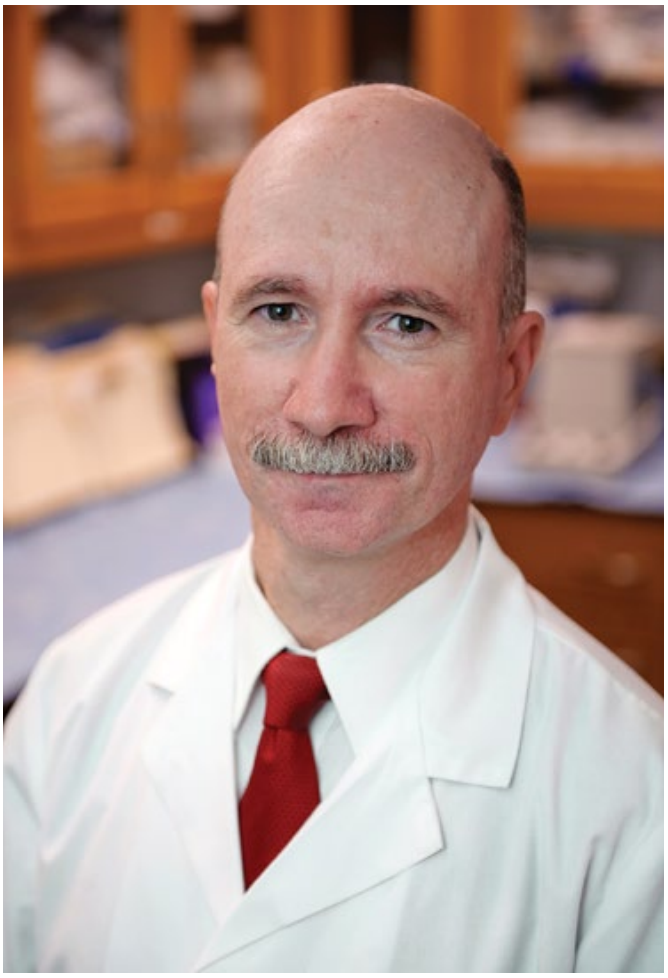


$15,000 average savings in hospital costs per incident when proactive care prevents a sickle cell crisis

CONRAD receives $80 million in federal research support for development of new HIV prevention options

CONRAD, a leading reproductive health-research organization based at EVMS, will receive up to $80 million over the next five years to fund research on products that reduce the spread of HIV in the developing world.

The award — from the United States President's Emergency Plan for AIDS Relief (PEPFAR) through the U.S. Agency for International Development (USAID) — will fund three areas of HIV prevention research including licensure and implementation of tenofovir gel, development of novel on-demand and longer-acting microbicide leads and development of objective measures of product adherence for vaginal and rectal microbicides.



Gustavo Doncel, MD, PhD

"We are deeply grateful to USAID for their continued support and to PEPFAR and the U.S. Congress for making HIV prevention a priority," says Gustavo Doncel, MD, PhD, CONRAD Scientific and Executive Director. "Developing products that women want to use as opposed to have to use is key to the successful assessment and implementation of HIV prevention strategies."

> "Developing products that women want to use as opposed to have to use is the key."
>
> Gustavo Doncel, MD, PhD

Globally, 35.3 million people are infected with HIV. In South Africa, prevalence of HIV has increased from 10.6% in 2008 to 12.3% in 2012, and condom use in South Africa has fallen in all age groups. Young, single women account for the highest rate of new infections. The need to develop and implement prevention options for those at highest risk of infection continues to be a top public-health research priority.

Tenofovir gel was the first product to provide proof that a vaginal gel used before and after sex could reduce HIV-1 and HSV-2 infections. A confirmatory study of tenofovir gel, sponsored by CONRAD and funded by USAID, the South African government and the Bill and Melinda Gates Foundation, is currently ongoing. If there are similar results, the gel could be fast-tracked by the FDA for regulatory approval.

Other products in the pipeline include a fast-disintegrating vaginal tablet and two vaginal rings that have the potential to be effective for up to three months. One ring in testing contains tenofovir plus a contraceptive, a combination that has the potential to provide triple protection against unintended pregnancies, HIV and herpes. □

Business executives join EVMS Foundation Board of Trustees


Cynthia Earhart


Steve Fredrickson


John Wynne Jr.

Three Hampton Roads business executives have joined the Board of Trustees of the Eastern Virginia Medical School Foundation. New to the board are Cynthia Earhart, Steve Fredrickson and John Wynne Jr. The Board of Trustees is the EVMS Foundation's governing body.

"The Board of Trustees is an important source of philanthropic guidance and support for the foundation and for EVMS," says G. Robert Aston Jr., TowneBank Chairman and CEO who serves as EVMS Foundation Chair and President. "We are very fortunate to welcome to the board three individuals who bring a wealth of knowledge and experience and who share an appreciation for the school's vital role in the life of the community."

Ms. Earhart is Executive Vice President Administration at Norfolk Southern Corporation. Previously, she served as Vice President Human Resources, Vice President Information Technology, Assistant Vice President Accounting Operations and in various other positions.

Ms. Earhart serves on the boards of LEAD Virginia, ACCESS College Foundation, the Urban League of Hampton Roads and the Sandler Center for the Performing Arts Foundation. A CPA, she holds a BS in accounting from the University of Missouri. She completed the Harvard Advanced Management Program.

Mr. Fredrickson co-founded Portfolio Recovery Associates, Inc., and is Chairman, President and CEO. He previously held leadership roles at Household Recovery Services' Portfolio Services Group and Household Commercial Financial Services.

He holds an MBA from the University of Illinois and a bachelor's degree from the University of Denver.

Mr. Fredrickson is active on the Financial Services Advisory Board of CIVC Partners and is Chair of the 2014 campaign for the United Way of South Hampton Roads, where he serves as a board director. He is on the Executive Advisory Council of Old Dominion University's College of Business and Public Administration.

John Oliver Wynne Jr. owns and is President and CEO of Labels Unlimited LLC, a labels and packaging company with locations in Virginia Beach; Wixom, Mich.; and Memphis, Tenn. Previously, Mr. Wynne held various positions within the investment banking units of Deutsche Bank and Morgan Stanley in New York. In addition, he is Chairman of the Board of Mosquito Joe, a national franchisor that provides mosquito control treatment to residential and commercial customers across the country.

Mr. Wynne is President-elect of the Princeton Club of Hampton Roads and is a member of the Norfolk Academy Alumni Board and the D.A. Taylor Charitable Foundation. Mr. Wynne received his AB in history from Princeton University and his MBA from the University of Virginia's Darden Graduate School of Business. □

Dr. Counselman in line to become president of American Board of Emergency Medicine

Frank Counselman, MD, the EVMS Foundation Distinguished Professor in Emergency Medicine and Chair of Emergency Medicine, has been chosen President-Elect of the American Board of Emergency Medicine.

The election will position Dr. Counselman, a 1983 EVMS graduate who also completed his emergency medicine residency at EVMS, as leader of one of the most influential organizations within emergency medicine in the United States when his term as president begins later this year.


Frank Counselman, MD

Dr. Counselman has held the top leadership position in a number of local, state and national organizations. He is a past president of the Norfolk Academy of Medicine, Virginia College of Emergency Physicians and Association of Academic Chairs of Emergency Medicine.

A member of Emergency Physicians of Tidewater, he is an expert on respiratory emergencies and marine envenomation and poisoning. He has received a number of honors, including election to the medical honor society Alpha Omega Alpha and selection by his peers for a Dean's Faculty Achievement Award. □

Dr. Mylona honored as servant-leader for contributions to medical education

A national organization dedicated to enhancing medical education has honored Elza Mylona, PhD, EVMS Vice Dean of Faculty Affairs and Professional Development, with its highest award.


Elza Mylona, PhD

The Servant Leadership Award is given by the Generalists in Medical Education (TGME) to a person who has advanced the mission of medical educators and who exhibits the characteristics of a "servant-leader" as described in a 1970 essay by Robert Greenleaf. It reads:

"The servant-leader is servant first. …It begins with the natural feeling that one wants to serve, to serve first. Then conscious choice brings one to aspire to lead. That person is sharply different from one who is leader first. …The difference manifests itself in the care taken by the servant-first to make sure that other people's highest priority needs are being served."

The TGME Steering Committee selected Dr. Mylona for the award because of her efforts to establish and improve faculty-development programs that cultivate excellence. She launched the first institutional mentoring program for junior clinical faculty, and she has served in leadership roles in a variety of professional associations, including the Association of American Medical Colleges groups on Educational and Faculty Affairs, the Association of Medical Education in Europe and TGME.

> "The servant-leader is servant first. …It begins with the natural feeling that one wants to serve, to serve first. Then conscious choice brings one to aspire to lead."

Prior to joining EVMS in the spring of 2013, Dr. Mylona was Associate Dean for Faculty Development at Stony Brook University Medical School. □

Diabetes expert named Vice Dean for Research


Jerry Nadler, MD

Jerry Nadler, MD, has been named to the newly created position of Vice Dean for Research at EVMS.

In addition to the new leadership role, Dr. Nadler will continue in his other roles as the Harry H. Mansbach Chair in Internal Medicine and Professor and Chair of Internal Medicine, and he will continue to provide oversight for the EVMS Strelitz Diabetes Center (SDC).

"Dr. Nadler will provide executive leadership and strategic oversight for our research enterprise while seeking ways to strengthen our infrastructure, enhance our translational research capability and promote collaboration with our strategic partners," says Richard Homan, MD, President and Provost of EVMS and Dean of the School of Medicine.

Dr. Nadler is a productive researcher and mentor who oversees a multifaceted research approach to diabetes and its complications. His extramurally funded research focuses on better understanding the role of inflammation in the development of diabetes and cardiovascular disease. The goal is to identify key targets leading to new ways to inhibit or even prevent the loss of pancreatic beta cell function and heart disease in people with diabetes. □

EVMS will host national conference on ultrasound in medical education

EVMS will showcase its extensive expertise in ultrasound March 21-22 when it hosts a national conference to show educators how to train students in the use of this valuable imaging technology.

Health-care providers are relying increasingly on ultrasound as the machines contract in size and cost and become portable. Some experts believe that handheld ultrasound machines will replace the venerable stethoscope as medicine's front-line tool of choice.

EVMS was chosen to host the Second Conference on Ultrasound in Anatomy and Physiology Education because of its broad expertise in the growing field. Among the EVMS experts are:

- Alfred Abuhamad, MD, Professor and Chair of Obstetrics and Gynecology and the Mason C. Andrews Chair in Obstetrics and Gynecology, who serves as President of the American Institute of Ultrasound in Medicine;
- Alexander Levitov, MD, Professor of Internal Medicine, the author of two popular books on the clinical use of ultrasound;
- Barry Knapp, MD, Associate Professor of Emergency Medicine, who has studied the use of ultrasound in the field by first responders;
- Craig Goodmurphy, PhD, Associate Professor of Pathology and Anatomy, a pioneer in incorporating ultrasound training into the medical curriculum.

EVMS is on the leading edge of a nationwide trend to teach medical students early in their careers how to use ultrasound.

The two-day conference is expected to draw 80 to 100 medical educators who want to develop or enhance their own ultrasound curricula at medical schools across the country, according to Dr. Goodmurphy, the conference director. The conference is sponsored by the Society of Ultrasound in Medical Education (SUSME). □

CDC grant aims to improve health in minority neighborhoods

EVMS has received a $240,000 REACH grant from the Centers for Disease Control and Prevention on behalf of the Healthy Norfolk coalition to improve health in neighborhoods that have large populations of racial and ethnic minorities.

REACH is an acronym for Racial and Ethnic Approaches to Community Health. Strategies include helping restaurants add healthful menu options and identifying opportunities to improve fitness and nutrition in workplaces and faith-based communities.

"The goal is to make the healthy choice the easy choice," says Amy Paulson, MPH, coordinator of the grant and Executive Director of the Consortium for Infant and Child Health based at EVMS. "For instance, if a church kitchen has a deep-fat fryer, we might suggest removing it and installing another oven."

> "The goal is to make the healthy choice the easy choice"
>
> Amy Paulson

Another aspect of the grant will focus on the City of Norfolk's development of a comprehensive bicycle-pedestrian plan. Paul Forehand, a project manager with the city's Department of Recreation, Parks and Open Space, says the plan will have a positive impact on commuting, recreation and tourism.

"Making Norfolk more bike- and pedestrian-friendly," he explains, "makes it more appealing to tourists, and that creates an economic benefit to the city. It also reduces traffic and enhances recreation options for residents." □

CIT grant supports study of Type 1 diabetes treatment

An EVMS physician-scientist studying new treatments for diabetes is among 14 researchers from across Virginia to receive funding from the Center for Innovative Technology.

Yumi Imai, MD, Associate Professor of Internal Medicine, will receive $100,000 to support her study of a new combination treatment for Type 1 diabetes.

In Type 1 diabetes, immune cells mistake beta cells as harmful and kill them. Beta cells are the body's only cells that produce insulin, so patients with Type 1 disease must inject insulin to stay alive.

"There are two challenges for the treatment of Type 1 diabetes," Dr. Imai says. "One is to stop immune cells from attacking beta cells. The second is to proliferate beta cells to regain enough number of beta cells."

The research tests a new combination of the compounds 12 lipoxygenase inhibitor and betatrophin. While the 12 lipoxygenase inhibitor protects the beta cells from the marauding immune cells, the betatrophin encourages the beta cells to regrow.


Yumi Imai, MD

The research is collaborative work undertaken with Jerry Nadler, MD, Vice Dean for Research, Chair of Internal Medicine and the Harry H. Mansbach Chair in Internal Medicine.

The CIT grant comes from the state Commonwealth Research Commercialization Fund (CRCF), which is designed to advance targeted areas of research with commercial promise. □

A new way to measure back pain?

Back pain is a common complaint. By one estimate, 80 percent of Americans will experience low-back pain at least once during their lifetime.

One frustration for doctors is the lack of an objective diagnostic test. They can rely only on the patient's subjective measure of pain.

But that may be about to change. Antonio Quidgley-Nevares, MD, Associate Professor and Chair of Physical Medicine and Rehabilitation, is working with proteomics experts in the school's Leroy T. Canoles Jr. Cancer Research Center to study the potential for developing a test. The science of proteomics uses proteins as clues to the presence of disease.

Their study looks for unique proteins in epidural fluid obtained from men undergoing steroid injection. They hope to identify one or more distinct proteins present in individuals who have suffered a back injury. Ultimately, those proteins could be used as the basis for a test.

The Kirk Family Research Fund supports the pilot study. "We are so grateful to the Kirk family for making this research possible," says Serena Amerson, Associate Director of EVMS Development. □

Liberty Tax challenge will provide matching-gift support for EVMS Fund

Liberty Tax has issued a challenge to its customers and supporters of EVMS: For every donation made to the EVMS Fund from Feb. 13 through March 31, 2014, the company will contribute $40 in honor of EVMS' 40th anniversary, up to a total of $25,000.

The EVMS Fund supports student scholarships, finances medical research and helps the school recruit the best and brightest health-care providers.

"At Liberty Tax, we realize how important EVMS is to our community," says Martha O'Gorman, Chief Marketing Officer. "Since it was founded in 1973, EVMS has become the cornerstone of health care in our region. That's why we're excited to help this academic health center continue delivering on the promise it made 40 years ago to improve health care for everyone in Hampton Roads." □

To learn more about the Liberty Tax Challenge, visit *evms.edu/libertytax*

Recipients of the President's Faculty Awards were, from left, Edward Oldfield, MD, Award for Achievement in Clinical Service; Michael Bono, MD, Award for Achievement in Teaching in the Clinical Sciences; Stephanie Troy, MD, Rising Star Award; Sergio Oehninger, MD, Outstanding Faculty Award; Ian Chen, MD, Award for Achievement in Mentoring; and Kurt McCammon, MD, Award for Achievement by Community Faculty. Not present for the photo were Richard Britten, PhD, Award for Research; Craig Goodmurphy, PhD, Philanthropy Champion Award; and Geoff Miller, Rising Star Award.

Recipients of the President's Staff Award included, from left, Meenal Walia, MPA, MPH, Award for Integrity; Connie McKenzie, Award for Outstanding Achievement; Capt. John Applewhite, Rising Star Award; Natalie Semmler, MBA, Rising Star Award; Carol Eugley, MBA, Award for Community Service; Therese Raunswinter, Award for Excellence; and Malissa Nesbit, Award for Collegiality. Not pictured is Susan Conner, Philanthropy Champion Award.

Visit *evms.edu/magazine* for a full list of this year's award honorees, as well as photos from the event.

EVMS honors faculty and staff at annual Service and Recognition Ceremony

EVMS recently handed out its top awards to staff and faculty.

The top honors went to Connie McKenzie, Director of Development, who received the Staff Award for Outstanding Achievement, and Sergio Oeninger, MD, PhD, Director of the Jones Institute for Reproductive Medicine and the Henry Clay Hofheimer II Chair in Obstetrics and Gynecology, who took home the Faculty Award for Outstanding Achievement.

They were among 17 award recipients who were selected by their peers for their exemplary efforts. The awards presentation followed recognition of faculty and staff who achieved service milestones measured in five-year increments.

Two employees — Tany Hassell and Kerrie Shaw — joined the exclusive group of employees with 40 or more consecutive years service to the school. EVMS opened in the fall of 1973. □

Two join Board of Visitors

The EVMS Board of Visitors recently welcomed two new faces.

Heyward Donigan is a leader in the managed-care industry, and Julie L. Damman, MD, is a physician and graduate of EVMS. The 17-member Board of Visitors is the school's governing body.

Heyward Donigan

Ms. Donigan is President and Chief Executive Officer of ValueOptions. She was previously Executive Vice President and Chief Marketing Officer at Premera Blue Cross. She has held senior management positions at Cigna Health Care, Empire Blue Cross and Blue Shield, General Electric, U.S. Healthcare and Partners Health Plans.

Ms. Donigan holds a Master of Public Administration from New York University.

Julie L. Damman, MD

Dr. Damman is board certified in internal medicine and practices in Norfolk.

She earned her medical degree from EVMS in 1988 after her undergraduate training at the University of Richmond. She completed her internship and residency at Yale University-Norwalk Hospital in Norwalk, Conn.

Dr. Damman has a special interest in women's health issues. □

From left are Mary Jo N. Martin, MD, Assistant Professor of Pathology and Anatomy; medical students Zachary Tyerman, Justin Drake and Andrew Simmelink; Marie Clay from the Huntington's Disease Society of America; and medical students Kevin Jiang and Kathryn Reardon.

EVMS students honored for advocacy to build awareness for Huntington's Disease

Two years ago during a neuroscience course, students in the MD Class of 2015 heard from individuals living with Huntington's Disease, a degenerative brain disorder that results in a loss of cognitive, behavioral and physical control.

The emotional stories about their daily struggles with the disease left an impression. Several students joined together and helped establish the Southeastern Virginia Affiliate of the Huntington's Disease Society of America (HDSA).

So, in 2013, when the local affiliate received the "Outstanding Advocacy Award" at the HDSA national convention, it returned the favor. The affiliate voted to give the advocacy award to the EVMS students in recognition of their efforts to educate the public about Huntington's Disease (HD).

"The affiliate members are overwhelmed that the students would choose to commit their precious time to help us spread awareness of HD," says Mary Jo N. Martin, MD, head of the affiliate and Assistant Professor of Pathology and Anatomy at EVMS. "Everyone in the group has been very impressed and inspired by the EVMS students."

> "The affiliate members are overwhelmed that the students would choose to commit their precious time to help us spread awareness of HD."
>
> Mary Jo N. Martin, MD

As part of their continued advocacy, the students are working on a video project with WHRO, Dr. Martin and neuroscientist Paul Aravich, PhD, Professor of Pathology and Anatomy. Their goal is a video intended to help first responders better understand HD and recognize the easily misunderstood symptoms of the disease.

"We've had instances in the area where individuals with HD have been arrested for public intoxication," Dr. Martin says, "despite carrying information about the disease." □

To learn more about Huntington's Disease and the local affiliate, go to *evms.edu/magazine*.

ENVISIONING THE F
OF MEDICAL

UTURE EDUCATION

Imagine it's the year 2033. You are a prospective student about to embark on your medical education. Clearly, the landscape of health care will have changed 20 years in the future. But how has academic medicine evolved to train those seeking a career in health professions?

No doubt, new tools will radically change medical education and clinical practice in the future. But as technological advances are made, "high tech" will need to be balanced with "high touch." The world's future health-care providers will be trained in a time when advanced simulation, self-paced curricula and team-based learning will prepare them with an extensive knowledge base and a high degree of technical proficiency in clinical skills.

"Ideally, medical education should be structured to produce graduates who have the competencies required to practice in the environment in which they are going to be practicing," says C. Donald Combs, PhD, Vice President and Dean of the School of Health Professions. "That's kind of a fundamental assumption, but often, we have not cared about the world of practice. Going forward, I think, we are going to have to be much more attuned to the context in which someone is going to be practicing."

Dr. Combs envisions that context will be technology and information heavy. "We're going to have very strict expectations about productivity, about competency and about the effectiveness of care," he says.

Team-based learning

Future medical students will train collaboratively with students in the health professions, mirroring the cross-disciplinary approach that will be integral to the clinical environment of the future.

"There is a big push for moving toward inter-professional education in medical education today," says Ronald Flenner, MD, Associate Dean for Medical Education and the James E. Etheridge Jr. Distinguished Professor. Unlike today, medical students of the future will be learning alongside physician assistants, surgical assistants and even nurses and pharmacy students, he says.

Dr. Combs sees the importance of learning in a team-based approach because of the productivity pressures mounting on physicians today. "We are going to have physicians practicing in a much more managerial role," Dr. Combs says. "They'll not only have to manage the therapeutic regimens of their patients but also have to manage a whole host of other providers like physician assistants and nurse practitioners."

Dr. Combs sees that shift occurring now. "Rather than the traditional model where physicians do it all by themselves, I believe that will be a smaller and smaller part of some practices, and their role will be more about managing a team," he says.

Self-paced curricula

With the cost and time it takes to train today's medical students, future students may find themselves being called "doctor" much sooner.

"There is going to be a departure from the traditional four years of medical school where everyone does the same thing," Dr. Flenner says. "Not everybody needs four years to finish.

Dr. Flenner sees a trend toward competency-based learning where reaching certain milestones would dictate when a student moves on. He also thinks that students will assume tracks based on their desired (or intended) specialties, which would put them on a faster track instead of taking time learning things that wouldn't apply to them, he explains.

Advanced simulation

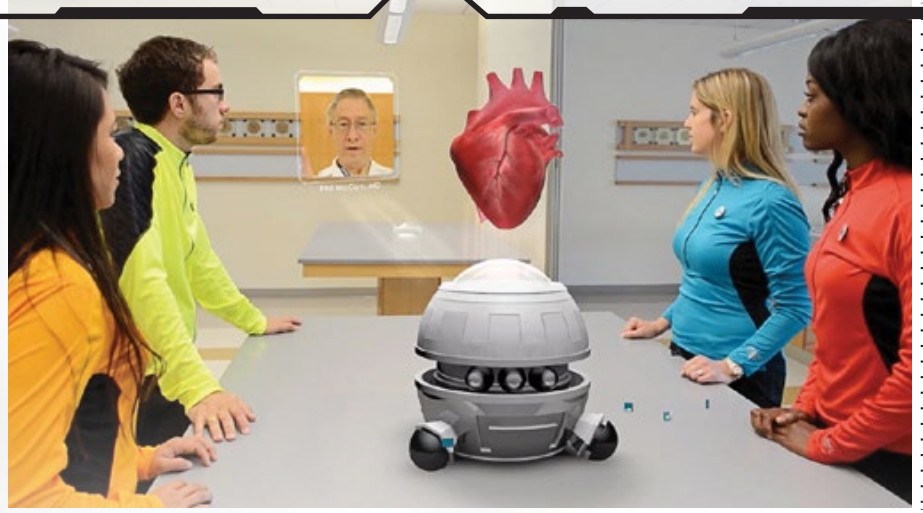
The old saying goes, "Practice makes perfect." But, in actuality, perfect practice makes perfect. Currently, medical modeling and simulation technology allow students to enhance and/or remediate skills as needed. Through the Sentara Center for Simulation and Immersive Learning at EVMS, students' skills can be assessed with a level of precision impossible to attain through human observation alone. In the future, Dr. Combs, who oversees medical modeling and simulation at EVMS, sees advanced simulation taking on an even greater role.

Dr. Combs says putting people in immersive learning environments, whether interacting with standardized patients — which is how it's done today — or working in a virtual-simulation lab — which is under development — or having an immersive experience in some other way not yet envisioned, allows students to practice skills correctly and get feedback in a much more intensive way.

He also foresees the widespread use of tactile holograms, which have interactive anatomy and programmable physiology. "From a training point of view," he says, "the metrics are far more precise. If you want to look at someone who is 10 percent overweight or 10 percent underweight, you can do that. It's all data that you pull in and configure it to be what you need."

Dr. Combs uses the example of Charles Dickens' A Christmas Carol where the character Ebenezer Scrooge is shown what his past, present and future look like.

"You start with the present, but if you want to educate, you can show what that patient was like as a young boy, or you can fast forward and say 'here's what happens to you if you don't change,'" Dr. Combs explains. "The mindset of today is you do an interview, you take the history, you try to diagnose and provide a treatment plan, but how useful would it be to have a hologram that can communicate so much more?"



Patient safety

Many hospitals struggle with transition of care, which is the movement of a patient from one setting of care to another or a hand-off of a patient from one health-care professional to another. During these transitions, poor communication and coordination among health-care professionals, patients and caregivers can lead to serious and even life-threatening situations.

Electronic-health records and networked communications have helped, but organizations, such as the Association of American Medical Colleges, say much can be done in the future to improve patient safety and outcomes.

"Because of residents' work-hour restrictions," Dr. Flenner says, "we tend to see more transition of care than ever existed. For example, before, you would just stay 36 hours to take care of the patients. Now, you're not allowed to, so someone else has to take over."

Dr. Flenner says teaching hand-offs at medical schools should become an integral component of the medical education curriculum.

Cloud-based technology — where medical records are stored securely and can be accessed by health-care professionals in real time — can smooth transitions by serving as a hub for patient data, preventing miscommunication among providers, Dr. Combs says.

Dr. Flenner agrees. "You can use technology to take out one more step where patient error can occur instead of using the old-fashioned way of going over a list to make sure you've done the right steps or ordered the right tests."

Future students will be able to capitalize on this new technology and advances in their medical education to be able to spend more time building strong relationships with their patients. After all, human interaction has no substitute. Learning a patients' stories, understanding their needs, and developing courses of treatment with them optimizes their health. □

EVMS' futuristic look at medical education wins big

The Association of American Medical Colleges (AAMC) recently challenged its member schools to envision the future of academic medicine by creating a two-minute video depicting medical education in 2033.

The AAMC announced at its annual meeting in November that EVMS' submission to the "Light-years Beyond Flexner: Academic Medicine in 2033" national video contest won first place.

Watch the video
evms.edu/magazine

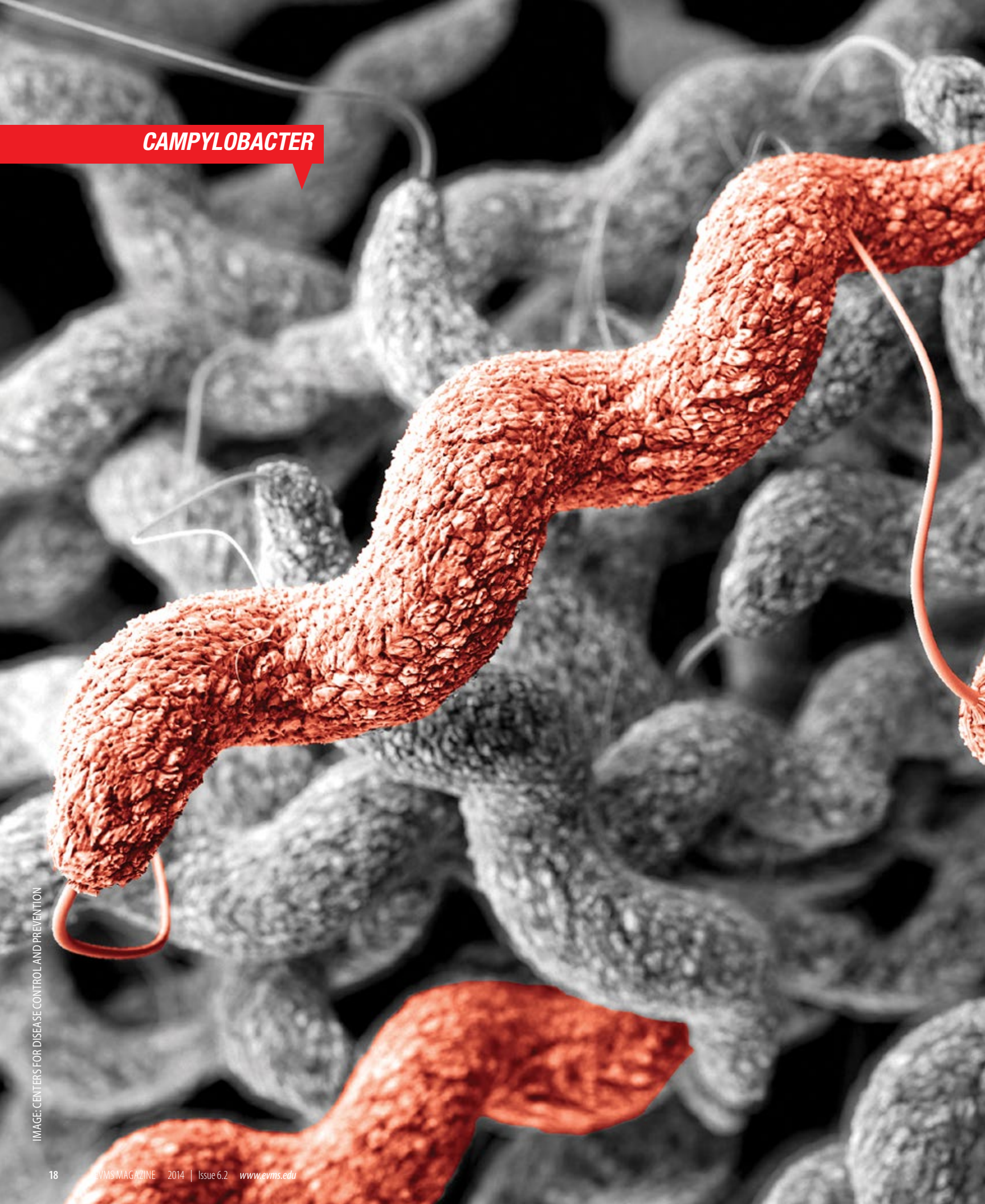


IMAGE: CENTERS FOR DISEASE CONTROL AND PREVENTION

DANGER AHEAD: THE RISE IN ANTIBIOTIC RESISTANCE

When Edward Oldfield III, MD, lectures second-year medical students, he tells them the great gift of antibiotics, lifesaving drugs of choice for 80 years, is disappearing.

You are destined, says the Professor of Internal Medicine, to practice in an era of limited choices because of the increasing resistance to the miracle drugs that quickly cured illnesses once considered fatal.

"Some people," he adds, "are talking about a post-antibiotic era. It's going to be like back in the 1930s when we didn't have anything."

How serious is that? Consider this: When penicillin came on the market in the 1930s, it increased survival rates from pneumonia and blood infection from 10 percent to 90 percent. In those days, dying young from an infection was accepted, something that is rare today.

Back then, researchers and physicians knew that bacteria, which mutates rapidly, would eventually develop resistance to penicillin and the series of drugs that have followed. Alexander Fleming, who discovered penicillin, warned about the problem when he accepted his Nobel Prize in 1945.

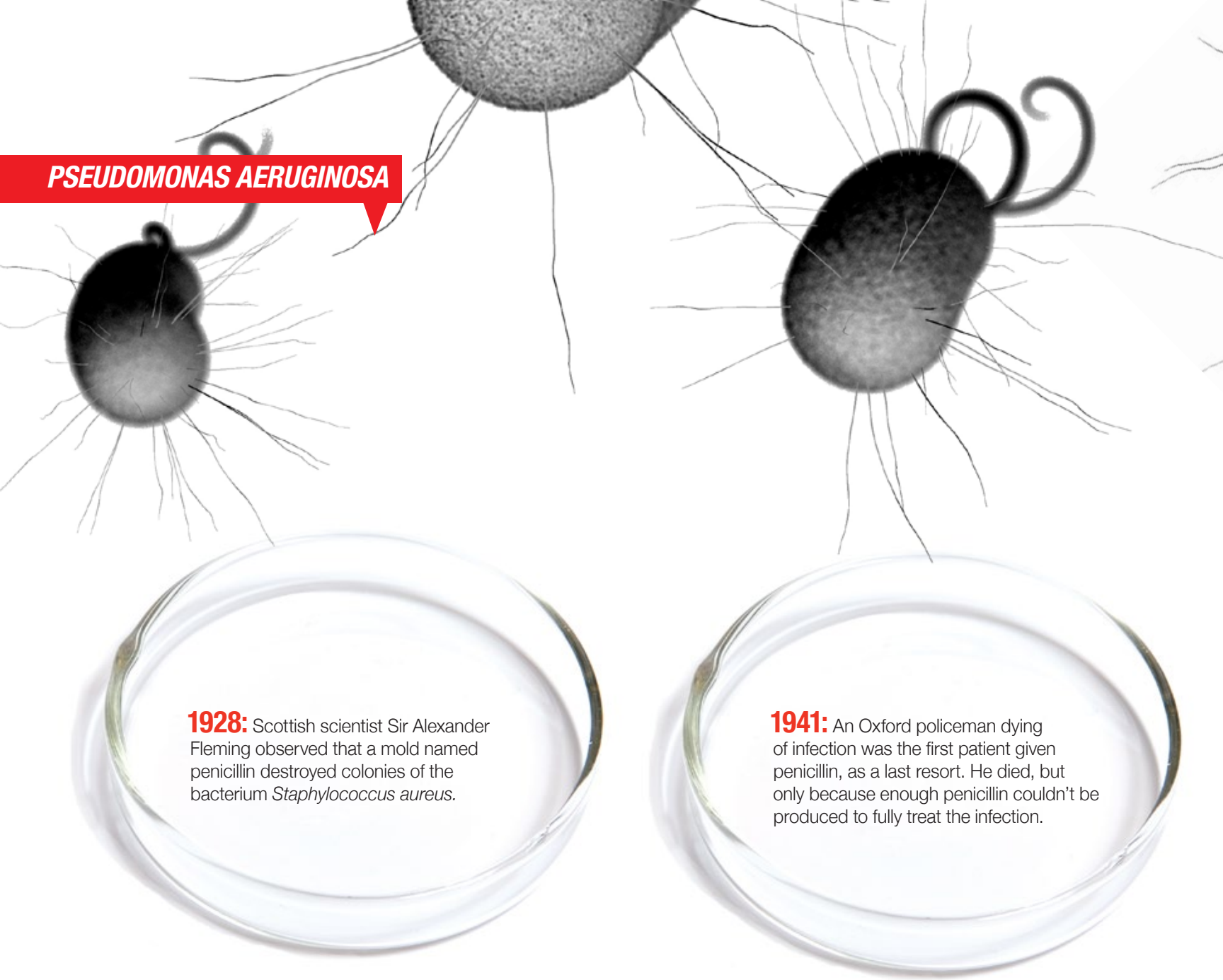
Now, public health officials are speaking in apocalyptic terms to describe the threat. In 2013, Centers for Disease Control and Prevention (CDC) Director Thomas Frieden, MD, and the United Kingdom's Chief Medical Officer Sally Davies, MB ChB, MSc, warned of a coming "health nightmare" and a "catastrophic threat" because of the rise of a bacteria resistant to carbapenems, powerful antibiotics considered the last line of defense.

A landmark report issued last fall by the CDC conservatively estimated that two million Americans get infections resistant to antibiotics, and 23,000 of them die annually, more than from AIDS or Parkinson's disease. A European Union report last year concluded that about 25,000 people there die every year from resistant bugs. According to the CDC, studies suggest antibiotic resistance is responsible for some $20 billion direct health-care costs and another $35 billion a year in lost productivity.

THE REGIONAL PICTURE

Dr. Oldfield says Hampton Roads hospitals have seen increasing numbers of infections resistant to powerful antibiotics, long considered the drugs of "last resort." In one case, bacteria resistant to one of those antibiotics became resistant to a second, newer antibiotic during treatment. The patient eventually died from sepsis despite the use of multiple antibiotics.

Local hospitals have also experienced problems with infections that can be resistant to essentially all antibiotics and can survive for long periods on glass, plastic, metal and other materials in a hospital room. "We had two or three clusters of related infections," Dr. Oldfield says, "and we had to be very aggressive in controlling them, but eventually we did control them." To do so, infection control specialists strip the wax off the linoleum floors and remove the curtains in patient rooms, and then do a thorough cleaning.



While some local hospitals have dealt with adult patients infected with emerging resistant bacteria, Stephen Buescher, MD, Professor of Pediatrics, says he hasn't seen similar problems in children. "We've been pretty lucky," he says. "We've had only a handful of those children, and when they showed up, our lab was in the mode of looking for those problems. The lab at CHKD was able to identify the problem quickly and put patients in contact isolation to prevent the spread, and we were able to treat them with antibiotics we had available."

Still, he says, vigilance remains high. "At the moment we're not hip deep in those kinds of problems. But we expect we're going to continuously interact with them in the future."

While the CDC report looks at antibiotic resistance nationally, Nancy Khardori, MD, Professor of Internal Medicine and an infectious disease specialist, says national data may not accurately reflect regional resistance patterns. In October, she and two students published the first survey of resistance in Hampton Roads using data from 12 regional hospitals. Dr. Khardori did a similar study in 2005 when she was the Chief of Infectious Diseases at Southern Illinois University School of Medicine.

Overall, Hampton Roads has more antibiotic resistance now than what she found in Illinois eight years ago. The surveys shows that the minimum concentration of antibiotics to combat strains of *Staphylococcus aureus,* the most common hospital-acquired pathogen, is increasing. The researchers also found "serious shortcomings" in studies that tested bacteria for antibiotic resistance, because of variations in methodology, interpretation and reporting by local labs. By standardizing regional testing, local health-care officials can better interpret

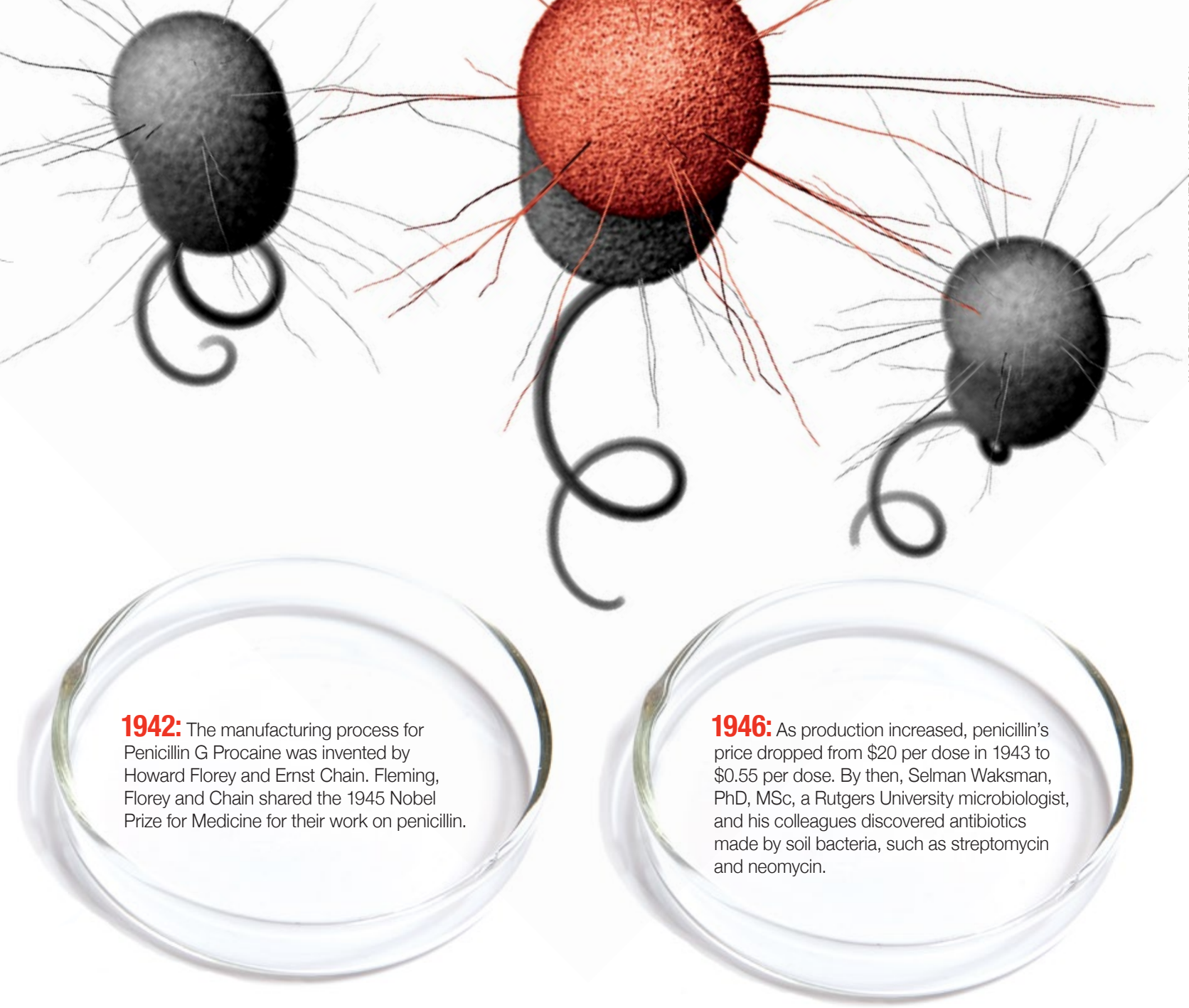


IMAGE: CENTERS FOR DISEASE CONTROL AND PREVENTION

1942: The manufacturing process for Penicillin G Procaine was invented by Howard Florey and Ernst Chain. Fleming, Florey and Chain shared the 1945 Nobel Prize for Medicine for their work on penicillin.

1946: As production increased, penicillin's price dropped from $20 per dose in 1943 to $0.55 per dose. By then, Selman Waksman, PhD, MSc, a Rutgers University microbiologist, and his colleagues discovered antibiotics made by soil bacteria, such as streptomycin and neomycin.

results and make changes to combat resistance.

"The danger and the risk are everywhere," Dr. Khardori says of the need for the survey. "What the regional study does is give us the exact scenario in the territory where we practice. Then we can handle things in a more targeted way."

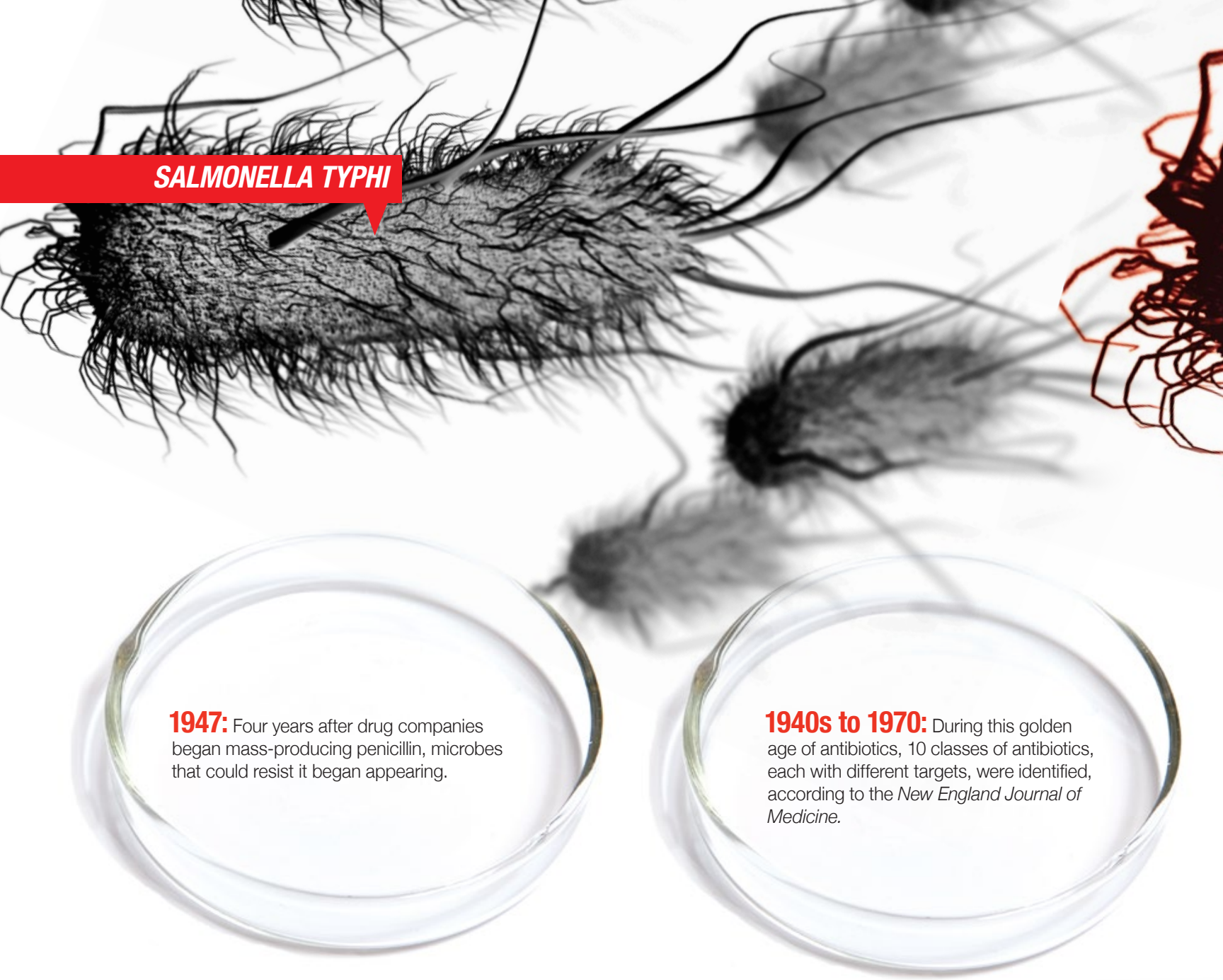
NARROWING THE TARGET

When a patient is admitted to a hospital with a serious infection, it generally takes two to three days for lab tests to determine the cause and the best antibiotic. However, doctors can't wait for the results because the infection will continue to grow. Therefore, often multiple antibiotics are prescribed initially while awaiting the results. That increases the potential that resistant strains will emerge.

By knowing what drugs are likely to be more effective, physicians can make a better first choice, Dr. Khardori says. "Constant vigilance looking at drug sensitivity is the only way we can give people the right antibiotic. If we wait for the laboratory to tell us what his or her bacteria looks like, we've lost the battle. What we should be telling our colleagues is these are the prevailing resistance patterns, something that will help them choose the optimal antibiotic up front."

Dr. Oldfield and Dr. Khardori say the problem is the result of overusing antibiotics, one of the major issues cited in the CDC and EU reports. "The mantra for antibiotics is the more you use it, the faster you lose it," Dr. Oldfield says, noting increased usage means resistant strains develop faster. "It seems like the bacteria are always one step ahead of us in anything that we try to do. They mutate so quickly."

The CDC report concluded that about half the antibiotics prescriptions written in the United States are inappropriate.



1947: Four years after drug companies began mass-producing penicillin, microbes that could resist it began appearing.

1940s to 1970: During this golden age of antibiotics, 10 classes of antibiotics, each with different targets, were identified, according to the *New England Journal of Medicine.*

Further fueling resistance is the use of antibiotics in animals. About 80 percent of the antibiotics used in the U.S. are given to livestock, often to promote growth in healthy animals, something that has been outlawed in Europe. Drug-resistant bacteria get into humans through meat and feces and can be spread through unclean hands or surfaces.

TACKLING THE CHALLENGE

Dr. Khardori says she will update the regional resistance surveillance annually. Creating a partnership among local health systems to track resistant germs could result in a reduction of resistance, she adds.

"Twenty years ago, we still had hope," she says. "We still had something in our pocket for when we would get down the line, and we would be able to overcome those bacteria that have become resistant. Now, in many respects, we're at the end of the line. There is not much in the pipeline (developing new drugs). That is the major difference between then and now."

Another issue is that new antibiotics are expensive to create. According to a World Health Organization report, drug companies are more focused on developing medications to treat long-term conditions rather than those that cure patients in a matter of days.

"We live in a bacterial world where we will never stay ahead of the resistant mutation curve," Dr. Oldfield adds. "A test of our resilience is how far behind the curve we allow ourselves to fall." With few drug companies looking to discover new antibiotics, "we are allowing ourselves to fall way behind the power curve."

Patients, he says, should make their doctors justify prescribing antibiotics; physicians should take the time to educate patients about bacteria, which don't respond to antibiotics, and side effects of certain antibiotics, which can include colitis, tendon ruptures and retinal detachment.

Dr. Oldfield ends his lecture on antibiotic resistance with a reminder: "Microbes swim in the evolutionary stream, and they swim much faster than we do. Bacteria reproduce every 30 minutes. For them, a millennium is compressed into a fortnight. Microbes were here learning every trick of survival two billion years before humans arrived. And it is likely they will be here two billion years after we depart." □

IMAGE: CENTERS FOR DISEASE CONTROL AND PREVENTION

2006: A study in *Nature Biotechnology* found that since 1998, the Food and Drug Administration had approved only four antibiotics.

2013: A CDC report noted that the number of new antibiotics developed and approved has steadily decreased in the past three decades and that only one new antibiotic was approved in the previous three years.


HIGH-TECH
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ADVANCED TOOLS & TECHNIQUES ENHANCE DIAGNOSIS & TREATMENT

Technology moves faster today than ever before, and medicine is no exception. That march of progress gives health-care providers an array of new tools to help catch problems early and treat patients with greater precision. Let's take a look at a few pieces of technology that are helping EVMS providers give even better care to patients.

SYSTEMS CONVERGE TO BATTLE CANCER

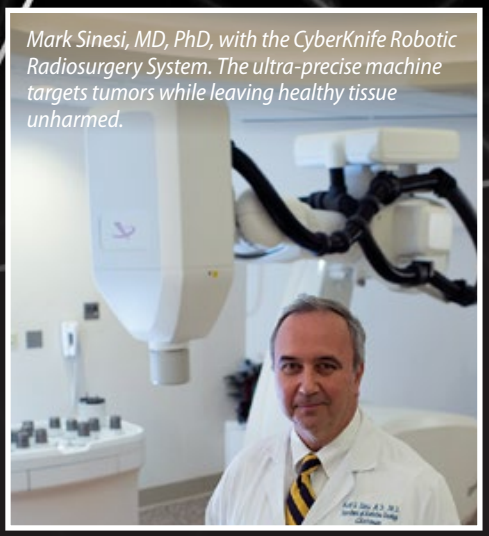
What do you get when you combine a robot made for welding cars, a linear accelerator and a computer similar to those found aboard cruise missiles? CyberKnife.

It's a technologically advanced system for delivering radiation therapy. As its name implies, it's as precise as a sharp blade, changing both the way tumors are treated with radiation and even the kinds of cancers it can fight.

Traditional radiation treatments damage healthy tissue surrounding the cancer. This damage is evident in side effects, such as blistered skin. Until recently, it's been a necessary evil of battling cancer. The risk of collateral damage can rule out radiation as a possible treatment for some forms of the disease — such as tissue that's previously been irradiated. CyberKnife changes that equation.

"It's a remarkable combination of technologies," says Mark Sinesi, MD, PhD, Chair of EVMS Radiation Oncology and Biophysics. He and his team runs the CyberKnife facility at Sentara Norfolk General Hospital, the only one in the region. "It's really opened up wonderful opportunities to take care of people where we couldn't before."

Unlike conventional treatment that irradiates uninvolved tissue, CyberKnife uses hundreds of smaller, less intense beams that pass harmlessly through



Mark Sinesi, MD, PhD, with the CyberKnife Robotic Radiosurgery System. The ultra-precise machine targets tumors while leaving healthy tissue unharmed.

surrounding tissue before converging on the tumor to deliver a full-power dose of treatment. It's so accurate that the machine's arm — the part originally intended to hold a welder — softly rises and falls as the patient breathes to stay pinpoint-focused on its target.

Brain tumors. Inoperable lung cancers. Cancer that has returned to previously irradiated tissue. Tumors near the spine. They may not be eligible for traditional radiation, but CyberKnife brings them back to the treatable side of the spectrum.

The technology is fascinating. However, Dr. Sinesi says the possibilities, the chances to fight back that this machine opens for patients, are the most significant aspects of this tool.

"It means patients have a chance for cancer control where there previously may not have been a viable option," Dr. Sinesi says, "and it allows treatment that is shorter in duration and higher in effectiveness."

NEW TECHNIQUES FIND DIABETIC NERVE DAMAGE

One of diabetes' cruel effects is damaged nerves, also known as neuropathy. High blood sugar can damage fragile nerve fibers, leaving patients with diminished sensitivity in their limbs and a variety of other, sometimes painful symptoms. Over the long term, this damage can lead to amputations and severely diminish quality of life, so spotting it early is a crucial step in living with diabetes. EVMS' Strelitz Diabetes Center is home to some of the world's leading experts in detecting and treating diabetic nerve damage, and their insight, combined with recently developed tools, is changing the way patients and clinicians battle neuropathy.

One such tool is Contact Heat Evoked Potential Stimulation — or CHEPS for short, and it is overturning traditional understanding of how neuropathy unfolds. In the past, neuropathy was considered to start at distant extremities, such as the feet, and work up toward the hands. By using mild heat to activate nerves and their associated receptors in the brain, EVMS researchers have shown that nerves in the lower back and forearm may actually be the first to sustain damage from diabetes or pre-diabetes. This new understanding means that clinicians have a simple way to identify patients in need of more thorough follow-up testing as opposed to the traditional skin biopsy used to check for damage.

"This is changing our understanding of what causes neuropathy and how to treat it," says Aaron Vinik, MB ChB, PhD, the Murray Waitzer Endowed Chair for Diabetes Research and Research Director at the Strelitz Diabetes Center.

People with diabetes may also have trouble dissipating heat. Their upper body may sweat significantly while their lower body doesn't, potentially leading to dry, cracked skin that can become a site

"IT'S REALLY OPENED UP WONDERFUL OPPORTUNITIES TO TAKE CARE OF PEOPLE WHERE WE COULDN'T BEFORE."

– MARK SINESI, MD, PHD, SPEAKING ABOUT THE CYBERKNIFE ROBOTIC RADIOSURGERY SYSTEM.

Beams from CyberKnife's robotic arm run through one of a variety of metal apertures, the size of which is selected based on the size of the treatment area.

of dangerous infections. This disturbance of thermoregulation stems from damage to minuscule nerves, some of the first to succumb to the biochemical imbalances diabetes created. An apparatus called Sudoscan can detect the movement of certain electrolytes in sweat glands and indicate whether those small nerve fibers are functioning properly.

A third tool gives yet another way to spot what is happening to delicate nerves by putting a device usually found in an optometrist's office to a new use. Corneal confocal microscopy — basically, a microscope designed to look into eyes — allows clinicians to closely examine the tiny nerve fibers that lace the clear front part of the eye. By counting the nerves in a given area, looking for division in the fibers and measuring their length, clinicians can see whether these sensitive nerves are healthy. Since they show damage very early in the diabetic process, it's possible to find problems and take action before diabetes fully takes hold.

Sensors in a cap allow the Contact Heat Evoked Potential Stimulation computer to detect which parts of the brain react when a patient's extremities are stimulated, helping clinicians detect potential nerve damage.

SEEING THE BRIGHTEST HOPE FOR A FAMILY

As far as fertility science has come since EVMS introduced in vitro fertilization to the U.S. in 1981, a heavy reliance on the art component of "the art and science of medicine" still is necessary when it comes to selecting embryos with the best chance of thriving in the womb.

Embryologists use their experience and biological clues to judge which embryos look the strongest, since they can't constantly watch them grow. But a new piece of equipment lets them do exactly that. The EmbryoScope, developed by Unisense Fertilitech, is an incubator with an integrated camera that records the eggs' progression from fertilization to just before implantation.

"The equipment can be set up so that you can look at it every 10 minutes or every half an hour," says Jacob Mayer, PhD, Professor of Obstetrics and Gynecology. "It'll take pictures and stream them as a movie, so you can actually see the development of the embryo over time."

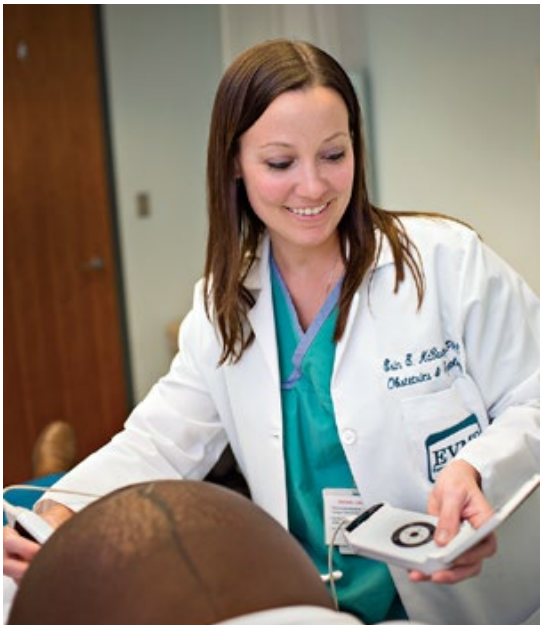
Embryologists can watch the time-lapse footage to see the timing of cell division, the presence of more than one nucleus — which is associated with poor implantation potential — and other key factors that contribute to an embryo's viability.

Another benefit is that embryos don't have to be taken out of the incubator to be examined under a microscope, which has been standard practice until now. Briefly taking them out of the incubator doesn't harm them. "But you don't want to keep them out too long. The incubator is where they want to be," Dr. Mayer says.

The step-by-step observation and more tightly controlled environment lead to as much as a 20-percent jump in IVF success — a world of difference to patients hoping to become parents. □

Alumni volunteer spotlight

Erin McCartney is back in the classroom – as teacher



Erin McCartney, MPA (MPA '09), knew she didn't want to leave Hampton Roads for her medical education. She was set on EVMS.

"My backup plan if I didn't get in to EVMS," she says, "was to try again the next year."

Fortunately, she got in. Her path after that, though, was a little less clear — until she completed a women's-health rotation that introduced her to high-risk obstetrics in EVMS Maternal-Fetal Medicine. She was fascinated and ended up working there again for the elective rotation during the second year of her PA education. She joined the practice immediately after finishing her training, and shortly thereafter, she began working with the program that had helped her land her dream job.

Ms. McCartney serves as a preceptor — a provider who offers opportunities for medical and health professions students to gain experience in clinical settings — for as many as three students for four-week stints. She also gives classroom lectures on "basic" pregnancy and delivery, in addition to clinical reasoning.

She gives of her time, she says, because others did the same as she was charting the course of her profession.

"We all have that person we remember having an impact on us as we were growing in our careers," Ms. McCartney says. "I want to be that person for the PA students. I genuinely love my job, and I like passing that on to students."

She believes it's important to stay involved with her alma mater because of the pivotal role alumni play in preparing up-and-coming providers to give excellent care from day one. And with market forces straining the supply of clinicians, it's more important than ever to ensure new graduates can rise to the challenges of modern medicine.

"The demand for PAs is increasing rapidly," Ms. McCartney says, "and in order to supply adequate health-care providers to the community, we have to teach them. We want quality for future generations, not just quantity." □

In September, nine alumni and 18 students from the School of Medicine gathered for a discussion about life as a health-care professional in the armed forces - the first ever SM-PACT (Students in Military medicine & Physician-Alumni Coming Together) gathering. The panelists answered questions on a range of topics, according to McCoy McHuy, the student who conceived of the project. The collaborative event between Alumni Relations, Careers in Medicine and the Military Medicine Interest Group, is believed to be the first of its kind in the nation. To learn more about the program or participate in future SM-PACT events, contact the Alumni Relations, alumni@evms.edu." George Sakakini, MD (MD'76), center, was one of several participants.

Lisa Barr, MD (MD '83), speaks with current EVMS medical students about what it's like to practice in her specialty — physical medicine and rehabilitation — during a session of the "Operation: MEDS" program. The series of informal gatherings brings EVMS alumni to campus so that current students can hear first-hand about the specifics of a wide range of specialties.

EVMS medical alumni from the '70s to the '00s — along with Robert McCombs, PhD, former Associate Dean of Students — came back to campus in October to catch up see how their alma mater has changed since their time in school. Mark your calendar for the next reunion, scheduled for Oct. 17-18, 2014.

Class **notes**

Have you been honored for your professional achievements? Received a promotion? Joined a new practice? Send a note to alumni@evms.edu so that we can celebrate your accomplishments by sharing them with our audiences, or you can post your news at *Facebook.com/EVMSAlumni*.

Mark Janczewski, MD
(MD '86, Family Medicine Residency '89)

Dr. Janczewski is among approximately 400 physicians in the nation to pass the first-ever certification exam in clinical informatics, which was administered in October 2013 by the American Board of Preventive Medicine. He has worked in the health IT field for more than a decade and also holds board certifications in aerospace and occupational medicine.

Allyson Hilliard, MD (MD '07)

The International Association of Healthcare Professionals selected Dr. Hilliard to be among the obstetrics and gynecology specialists honored in its publication, "The Leading Physicians of the World." Dr. Hilliard practices at Southpointe OBGYN, LLC, in Fredericksburg, Va. Her expertise is in diagnosis and treatment of infertility, dysfunctional uterine bleeding and the provision of minimally invasive surgery services for women.

Jeffrey Wilson, MD (MD '97)

Dr. Wilson won top honors in the 2013 Military Writer's Society of America (MWSA) Book Awards program for his novel, "The Donors." An annual awards program, MWSA — an association of more than 800 authors, poets, artists, and photographers — recognizes outstanding military-themed books in a wide range of categories. "The Donors," a novel that fuses elements of horror, medical suspense and the supernatural, earned a Gold Medal in the Science Fiction/Fantasy/Horror category.

Neil Vachhani, MD (MD '03)

Dr. Vachhani was named as the new Head of the Section of Pediatric Imaging at the Cleveland Clinic. A member of the Cleveland Clinic professional staff since 2009, Dr. Vachhani is tasked with growing pediatric imaging enterprise-wide and continuing to provide high-quality pediatric imaging and excellent patient care. □

Be a Game-Changer team captains greet Richard V. Homan, MD, President and Provost of EVMS and Dean of the School of Medicine, as he arrives at the kick-off event for the employee giving campaign.

Faculty, staff are game-changers for EVMS

The totals are in. EVMS' month-long employee giving campaign, whose theme was "Be a Game-Changer," raised more than $81,000 for the EVMS Fund from 292 faculty and staff members, a 14 percent increase in the number of donors over last year. Sixty-two of the donors were first-time participants.

"We're so proud to see this campaign grow every year," says Abbie Bartlett, Assistant Director of Annual Giving. "The tremendous support shown by faculty and staff proves that the EVMS team always comes through."

This year's theme, inspired by that strong sense of team spirit, helped tie all the campaign elements together. For example, the campaign's grand prize was a Redskins game package donated by Summit Group of Virginia. Weekly campaign prizes included ODU football tickets, also donated by Summit Group, along with an EVMS folding chair, donated by Matthews EVMS Bookstore, and an EVMS cooler bag and wine tote, donated by Polar Bear Coolers.

The campaign succeeded in large part because of the work put in by its co-chairs, Julie Kerry, MD, Associate Professor and Chair of Microbiology and Molecular Cell Biology; and Susan Conner, Administrative Assistant in Physiological Sciences, along with the faculty and staff members who served as team captains.

The EVMS Fund provides a vital source of support for a variety of needs, from scholarships and student-research stipends to new technology and facility renovations. □

Donation helps fund Schellhammer Professorship

Richard Homan, MD, right, EVMS President and Provost and Dean of the School of Medicine, accepts a check from faculty at Urology of Virginia and its affiliated foundation, SURF, as the final donation to fund the Paul and Ann Schellhammer Professorship in Cancer Research. Many donors provided support for the professorship. From left are Paul Schellhammer, MD; Robert Given, MD; Barbara Gornto; Ray Lance, MD; Kurt McCammon, MD, Shellhammer Professorship, Devine Chair in Genitourinary Reconstructive Surgery and Chair of Urology; and Mike Fabrizio, MD.

Donor Profile

Virginia Beach woman makes gift to fund cancer research lab

Carolyn McDonnell

Jerry and Carolyn McDonnell were always quiet givers. Married for 29 years, the Virginia Beach philanthropists gave generously and often to a wide range of local organizations. "We liked seeing our contributions in action," Ms. McDonnell says. "That was thanks enough."

Her recent gift to EVMS, one that bears her husband's name, wasn't about getting a thank-you. It was about giving one. The Gerald F. McDonnell Head and Neck Cancer Research Fund will establish a laboratory at EVMS to help investigate new therapies for patients afflicted with head and neck cancers.

"They gave my husband more time and saved my best friend's life. Grateful isn't a big enough word."

– Carolyn McDonnell

"If it weren't for Dr. Dan Karakla and his EVMS team, my husband would have been dead in a month," Ms. McDonnell says. "Instead, he had two extra years." The couple had spent several frustrating months looking for answers to Mr. McDonnell's slurred speech and a tongue that didn't feel right. Finally, a friend told them about head and neck cancer specialist and EVMS Associate Professor Daniel Karakla, MD. A biopsy revealed metastasis squamous-cell carcinoma on the back of Mr. McDonnell's tongue — and it was strangling his carotid artery.

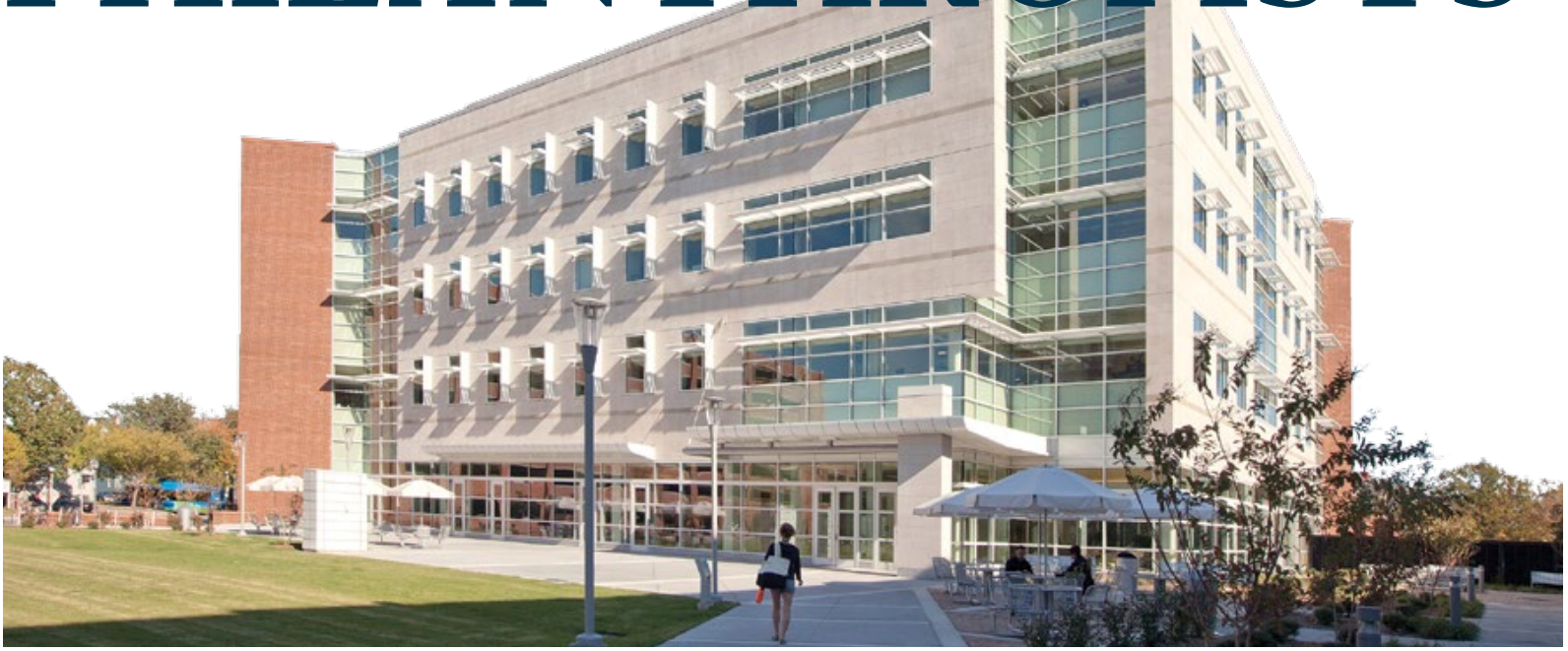
The complicated and delicate cancer surgery performed by Dr. Karakla and a team of EVMS specialists took more than six hours. Dr. Karakla's skill helped free Mr. McDonnell's carotid artery, but it was his compassion in the months following treatment that Ms. McDonnell will never forget. "I don't think I've ever experienced another doctor like him," she says. "I'd see him in the hospital walking with a group of students, these young doctors, and I could see how much they respected him. How lucky we are to have EVMS and such excellent doctors working and teaching here."

Forty years ago, doctors might see 40 of these cancers a year Dr. Karakla told the McDonnells. Now, it's 40 a month. For Ms. McDonnell, the troubling statistics hit home just six months after her husband's death. Her best friend had a dry cough that had been going on too long. "I got her right in to see to Dr. Karakla." Amazingly, her friend had the same cancer as her husband — only this time it was caught earlier and was located on the voice box, a far more treatable place.

Ms. McDonnell always wanted to do something for EVMS to honor her husband and to thank Dr. Karakla and his team. "We talked about establishing a research lab, and I thought wow, now maybe we can start to get ahead of this thing." Hearing herself, she laughs. "Listen to me! I'm talking like I'm one of the team." □

A $1 million gift from the Waitzer family is transforming EVMS through the creation of the Murray Waitzer Endowed Chair for Diabetes Research. The chair is named in honor of a local attorney and business leader, who wrestled with Type 1 diabetes, and will fund research to help stem the rising tide of diabetes in Hampton Roads. The first faculty member to hold the chair is Aaron Vinik, MD, PhD, Director of Research and the Neuroendocrine Unit at the EVMS Strelitz Diabetes Center. EVMS celebrated the Waitzer family gift at a recent luncheon; pictured from left are Dr. Vinik, his wife, Etta Vinik, and four members of the Waitzer family: Kathy, Eddie, Richard and Leah.

A REPORT TO OUR
PHILANTHROPISTS



Choosing EVMS as the recipient of your philanthropy demonstrates your belief in our focus: that we are here, first and foremost, to safeguard our community's health.

Every day, your support enables our physicians and health professionals to transform the lives of your friends and neighbors. Through your generosity, we're also training more students and residents every year to meet our community's need for a larger health-care workforce.

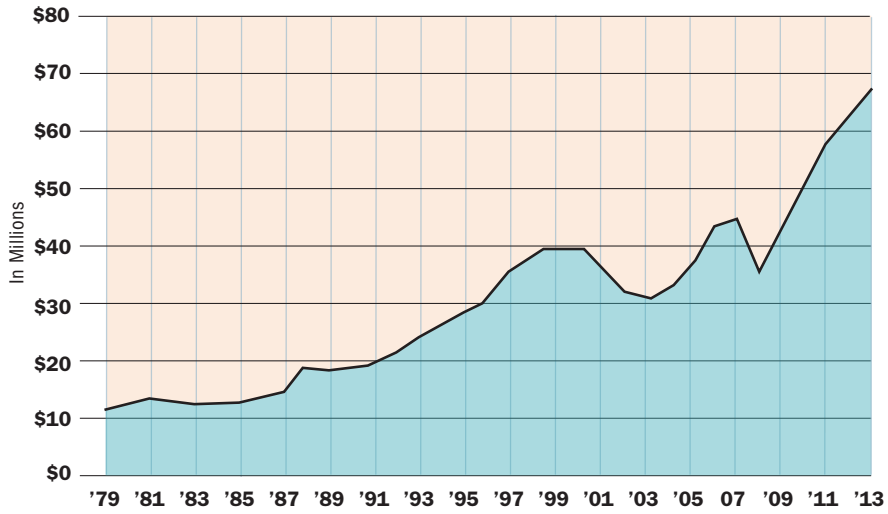
To that end, we are pleased to report on the growth of our endowment. This vital source of funding serves to advance our curriculum and recruit more world-class physicians to educate our students and research lifesaving care. Our endowment also creates more scholarship opportunities so that aspiring caregivers can choose specialties based on their passions rather than their burden of debt.

Thank you for entrusting your philanthropy to EVMS. Rest assured that we strive to return greater value on every gift you make to this great school. It is an investment in our future, and for that we are tremendously grateful.

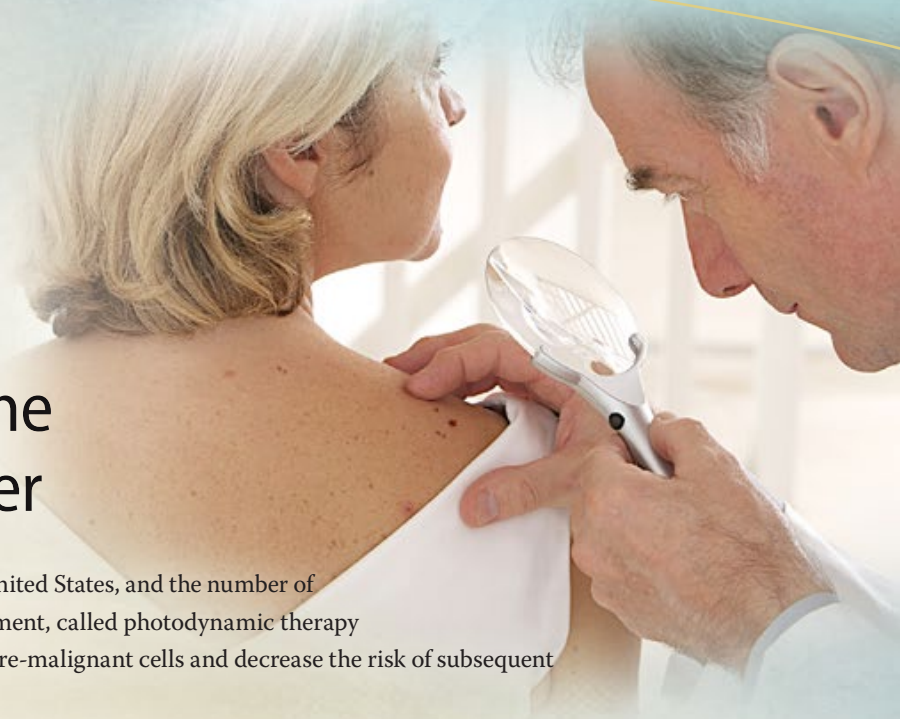
EVMS Foundation
FY13 Balance Sheet Highlights

- Contributions and pledges:
  $10,100,337
- Distributions from EVMS Foundation to EVMS:
  $6,495,723
- Change in net assets:
  $8,874,034
- Net assets at end of fiscal year:
  $76,524,030

EVMS Foundation
Endowment



Please visit www.evms.edu/evmsfoundation
for a more detailed report on fiscal year 2013 for both EVMS and the EVMS Foundation.



Photodynamic Therapy

A new technology in the fight against skin cancer

Skin cancer is the most common form of cancer in the United States, and the number of cases continues to grow. Now a relatively new type of treatment, called photodynamic therapy (PDT), uses a combination of drugs and light to eliminate pre-malignant cells and decrease the risk of subsequent melanoma and non-melanoma skin cancer.

Bryan Carroll, MD, PhD, Assistant Professor of Dermatology and Director of Dermatological Surgery, explains that the process starts with applying a medication to the skin of the area being treated. The medicine is absorbed by the body's abnormal cells and makes them sensitive to light. After a period of incubation, the area is exposed to light, which activates the medicine, and the cancer cells are destroyed.

"PDT has the greatest effect on in-between cells that don't yet have the roots that require surgery but still increase your risk of developing skin cancer," Dr. Carroll says.

Those cells are called actinic keratosis, which is a condition caused by years of sun exposure or intense sun exposure for fair-skinned people. These rough, small, red patches of skin are one of the most common pathologies seen by dermatologists.

When a person has a few lesions of actinic keratosis, those can be treated more easily with liquid nitrogen, Dr. Carroll explains. But when a patient has more than 15 to innumerable lesions, a field treatment like PDT is used. In addition to treating the lesions you can see, PDT also treats the spots that are too small to target with liquid nitrogen.

"PDT has the greatest effect on in-between cells that don't yet have the roots that require surgery but still increase your risk of developing skin cancer."

— BRYAN CARROLL, MD, PHD

The duration of other field treatments, although effective, can last for weeks and cause skin reactions like ulcerations that are not only painful but also unattractive, Dr. Carroll says.

"PDT has the benefit of being a gentler treatment. It is a lower pain method but is still effective," he says.

After a grateful patient gifted the PDT equipment to EVMS Dermatology in June, Dr. Carroll and his colleagues began using it to treat a number of high-risk cancer patients and transplant patients, who are more susceptible to getting skin cancer.

"We use PDT in conjunction with or as an alternative to other field treatments," Dr. Carroll says. "We do special protocols by combining medications to achieve greater efficacy. We go above and beyond."

Even though EVMS dermatologists have seen great results with this technology, decreasing the risks for skin cancer, this isn't an excuse to worship the sun.

"PDT does not replace good UVA and UVB protection or self-skin exams," Dr. Carroll stresses, "which are the foundations of good skin-cancer management." □

inFocus

Photos of EVMS students supporting the JDRF Walk to Cure diabetes, the region-wide diabetes awareness campaign, campus flu shots, a gathering of members of the new EVMS Philanthropic Advisory Board, faculty lending a hand in the community, a gift from the Norfolk Temple #3 Pythian Sisters and a scavenger hunt to support autism research and care.

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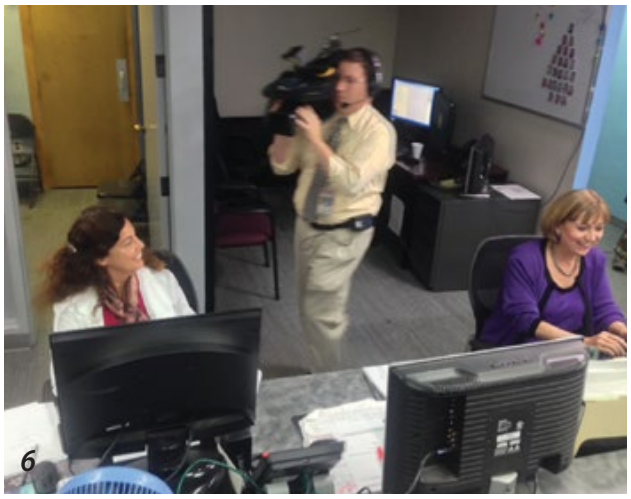
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VISIT *www.flickr.com/evms* to view more photos from these and other EVMS events.

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1. Members of the EVMS Student National Medical Association and the EVMS Diabetes Club volunteered for the Juvenile Diabetes Research Foundation (JDRF) Virginia Beach Walk to Cure Diabetes in October. Pictured are (top row) Althea Gunther, Isabelle Nguyen, Jessica Buford, Martekuor Dodoo, Courtney Strickland, Jasmine Hall, Brandon Layne (bottom row) Ondreia Hunt, Neesee Boulden, Ezra Boulden and Chantel Styles.

2. EVMS created distinctive graphics to emphasize the importance of knowing your risk for developing diabetes. The school worked with cities, hospitals and businesses throughout the region to spread the word using a series of sidewalk decals.

3. EVMS students help hand out t-shirts during EVMS Diabetes Awareness Night with the Norfolk Admirals Nov. 11 at Norfolk Scope. Diabetes is now at epidemic levels here and nationwide, and the Admirals night was one aspect of a month-long public campaign to encourage people to get tested and know their risk for developing diabetes.

4. Richard Homan, MD, President and Provost of EVMS and Dean of the School of Medicine, set a good example early in the flu season when he lined up with other EVMS faculty and staff for a flu shot. Lisa Lee of Occupational Health was on hand during this clinic.

5. Members of the new EVMS Philanthropic Advisory Board recently had an experiential evening at the EVMS Strelitz Diabetes Center. Pictured are David Lieb, MD, Assistant Professor of Internal Medicine, with Philanthropic Advisory Board members Tricia Randall, Kelley Healey and Laura Lewin.

6. EVMS physicians Laurel Stadtmauer, MD, PhD, Professor of Obstetrics and Gynecology; Margarita de Veciana, MD, Professor of Obstetrics and Gynecology; and David Archer, MD, Professor of Obstetrics and Gynecology (not pictured), fielded questions about infertility during a live web chat, which aired on WVEC TV-13 and WVEC.com.

7. Norfolk Temple #3 Pythian Sisters held a dinner to raise funds for the EVMS Strelitz Diabetes Center. Pictured are Lynn Benedick, Sara Fitchett, Aryles Hedjar (an EVMS medical student), Faye Faella, Wanda Arbour, Rosemaire Hitt and Rick Hitt.

8. A team of EVMS students prepares to take part in a scavenger hunt hosted by Families of Autistic Children in Tidewater (FACT) at the Virginia Beach oceanfront Nov. 10. A portion of the event proceeds support clinical and research efforts of EVMS' Autism Spectrum Disorders Program.

EVMS
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OUR MISSION: Eastern Virginia Medical School is an academic health center dedicated to achieving excellence in medical and health professions education, research and patient care. We value creating and fostering a diverse and cohesive faculty, professional staff and student body as the surest way to achieve our mission. Adhering to the highest ethical standards, we will strive to improve the health of our community and to be recognized as a national center of intellectual and clinical strength in medicine.