FOREVER JOINED AT THE HEART

Formerly conjoined toddlers Maria and Teresa Tapia lead healthy, separate lives after a surgical separation at the Children’s Hospital of Richmond at Virginia Commonwealth University — a remarkable example of the milestones that provide opportunities for reflection and celebration. This year, we have a unique opportunity not only to review a single year of accomplishments, but also to mark the 10th anniversary of the VCU Health System, created to consolidate the clinical services of VCU into one unified organization.

The VCU Medical Center marks this decade of difference with a look at the milestones made possible through the support of the health system — including the 2011 stories of advances in patient care, education and research.
This past year was a remarkable one for the VCU Medical Center. Not only was it a year of significant achievements, but it also represented 10 years since the VCU Health System began operations. Thus, for this year’s report, we are celebrating both our recent successes in 2011 and our major milestones of the past decade.

As a robust medical center encompassing five health sciences schools — Allied Health Professions, Dentistry, Medicine, Nursing and Pharmacy — along with the clinical care delivered by the VCU Health System, which comprises MCV Hospitals, MCV Physicians and the Virginia Premier Health Plan, we are honored to be one of the leading and most comprehensive academic health centers in the country. Today’s stories along with those of the past decade demonstrate an institution that is achieving national pre-eminence because of its many talented and dedicated professionals.

Our mission of restoring and preserving health, seeking the cause and cure of diseases, and educating the health professional workforce for the commonwealth and beyond touches lives throughout the world. If there is a singular event that characterized 2011, it was in November with the surgical separation of conjoined twins from the Dominican Republic. This remarkable surgical feat was just one powerful example of the capabilities of the talented individuals at the VCU Medical Center who are devoted to children’s health care around the globe. The 20-hour surgical procedure, and the subsequent post-surgery care and therapy were extraordinary demonstrations of courage and talent from a capable and compassionate team of nearly 200 health care professionals.

Reflecting back on the past decade, we celebrate 10 years of the Virginia Coordinated Care (VCC) program. The VCC began 12 years ago as a vision for providing an organized medical home model for thousands of medically uninsured patients in the Richmond region. Since its inception, the program has almost tripled in size to nearly 30,000 enrollees and has produced evidence-based outcomes of improving access while reducing unnecessary utilization and costs. As our nation embarks on health care reform measures that embrace population health management, the VCC demonstrates the VCU Medical Center as a leader and innovator in integrated delivery system models.

Typical of all years representing the past decade, we were honored again with many accolades in 2011, ranging from our national and regional rankings in U.S. News & World Report to program recognition in Anthem Blue Distinction Centers of Excellence; from Beacon Awards for nursing and clinical care in five of our ICUs to our seventh recognition as a Working Mother magazine “100 Best Companies,” as well as local and national recognitions as "top doctors" for many of our faculty.

As part of the VCU Medical Center leadership team, we are proud to be part of an exciting institution that is advancing on so many fronts. We invite you to spend time browsing the report here and also online at www.vcuhealth.org/annualreport.
When it comes to patient care, our success draws the national spotlight. We’ve built one of the most prolific artificial heart programs and are revolutionizing coordinated care. Our innovations combine with numerous national awards and rankings, making our patient care systems a model for success.

Model for coordinated care

Through the 1990s, a lack of access to primary health care among Richmond’s uninsured and underserved populations clogged VCU Medical Center’s Department of Emergency Medicine with primary care-treatable issues. In 2000, the VCU Health System resolved this problem and improved the quality of its emergency care residency programs by forming Virginia Coordinated Care, a managed care program that provides uninsured citizens with access to area primary care physicians. The program now serves as a supporting model for managed care plans nationwide.

21st-century solutions

Since the VCU Health System implemented Cerner in 2004, the information technology platform has grown to encompass nearly every facet of patient care. What started as a basic record-keeping tool has evolved into a comprehensive, integrated system that allows physicians to place orders, update charts, retrieve lab results and write prescriptions, as well as better communicate with team members to monitor patient progress, assess potential risk factors and update care plans, targets and goals — whether they’re at the office, at home or by the bedside.

A success that couldn’t wait

When Luke Giannini fell critically ill due to heart failure, he looked no further than Richmond to find top-flight care. Doctors at the VCU Medical Center implanted a SynCardia temporary Total Artificial Heart — the only device that’s FDA-approved as a bridge to human heart transplant — giving the 25-year-old a new chance at life. Since implanting the first artificial heart on the East Coast in 2006, VCU’s program stands as one of the most prolific in the nation, with an 85 percent survival rate among patients who received a temporary heart and a more than 95 percent survival rate among those who received donor hearts.

Magnet: nursing excellence

VCU Health System received re-designation in 2011 as a Magnet hospital, the highest honor awarded by the American Nurses Credentialing Center (ANCC) for nursing excellence in health care. The health system originally received the four-year designation in 2006. Magnet designation recognizes excellence in 60 standards that touch all aspects of the field. In 2011, two years after the ANCC implemented rigorous new standards, less than 7 percent of registered hospitals achieved Magnet status. The VCU Health System received a score of excellent across the board.

For more on these stories, visit www.vcuhealth.org/annualreport.

Forever joined at the heart

When the nurse presented Lisandra Sanatis with her twins, Maria and Teresa Tapia, on April 8, 2010, and explained to her that the girls were conjoined and might not make it, Sanatis said she put her faith in God. And, when she and her doctors in the Dominican Republic reached out for help in determining the next course of action, Sanatis put her faith in the Children’s Hospital of Richmond at VCU.

While the girls shared a liver, as well as parts of their biliary system, pancreas glands and the first part of their small intestine, they were otherwise separate, with normally functioning organs throughout the majority of their bodies, including their lungs, hearts, renal systems and extremities, which led David Lanning, M.D., Ph.D., associate professor in the Department of Surgery and CofR’s surgeon-in-chief, and a 45-member volunteer team of physicians and pediatric specialists to believe a successful separation could be completed.

However, what started as a medical case quickly turned into a community rally that extended far beyond hospital walls. Students and faculty in the Department of Fashion Design and Merchandising designed dresses for the girls to wear while they awaited surgery. Morgan Yacoe, a senior in the Department of Sculpture, spearheaded an effort to create a plaster casting mold of the twins’ bodies to assist surgeons’ preparation for the surgery. And, with so many trips between hotel and hospital to be considered, Audrey Kane, an occupational therapist at VCU and a certified car seat technician, designed a special car seat large enough to accommodate Maria and Teresa.

Almost a year after their arrival, on Nov. 8, 2011, doctors finished a 20-hour series of procedures to divide the twins’ liver and other shared organs before reconstructing their abdominal walls, and by year’s end, the girls returned home to the Dominican Republic with their mother.
A DECADE OF TOP-FLIGHT CARE

The VCU Medical Center’s LifeEvac program, which provides air medical transport service for critically ill or injured patients, marked its 10th year of service in 2011, and since its inaugural flight on Oct. 14, 2001, has averaged approximately 600 flights per year.

Born from a partnership with Denver-based Air Methods Corp., the largest air medical provider in the world, LifeEvac bases run 24 hours a day, seven days a week, and each state-of-the-art helicopter comes equipped with a critical care nurse, a critical care paramedic and a seasoned pilot who stand at the ready to respond to accident scenes throughout Virginia and portions of North Carolina.

With critical injuries, time is always of the essence, and with LifeEvac, patients not only have access to expert care while en route to the hospital, they’re also given the benefit of added minutes and hours that can save their lives.

For example, on its inaugural flight, LifeEvac flew 65 miles to Southside Community Hospital in Farmville to bring a patient with a head injury back to the medical center. The trip — which would have taken about two hours by ground ambulance — took less than one hour in the LifeEvac helicopter.

SAFE, EFFICIENT RADIATION WHERE IT’S MOST NEEDED

The Massey Cancer Center became the first of its kind in the Richmond area to offer volumetric modulated arc therapy (VMAT) — a safer, more effective form of radiation treatment for multiple tumor sites, including the prostate, head and neck area, brain, breasts and lungs.

VMAT is a new form of intensity modulated radiation therapy whereby the radiation source rotates 360 degrees around the patient in single or multiple arcs to continuously irradiate the tumor. This technique maximizes and more accurately targets radiation to the tumor site, reduces the amount of radiation needed to deliver the prescribed dose, and better protects surrounding healthy tissues. Similarly, VMAT decreases the treatment time per radiation session to two to three minutes, as opposed to 10 to 20 minutes with conventional radiation therapies, leading to improved patient comfort and fewer appointments rounding healthy tissues. Similarly, VMAT decreases the treatment time per radiation session to two to three minutes, as opposed to 10 to 20 minutes with conventional radiation therapies, leading to improved patient comfort and fewer appointments.

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SOMATOM CT scanner

The SOMATOM Definition Flash by Siemens Healthcare, or “Definition Flash,” features two X-ray tubes that simultaneously revolve around the patient’s body to produce a more comprehensive image of the body 20 to 40 times faster than a conventional CT scanner.

“We’re proud to be the first hospital in Virginia with this new technology,” said Ann Fulcher, M.D., professor and chair of the Department of Radiology.

“This system can scan the entire body in less than five seconds and requires only a fraction of the radiation dose compared with conventional scanners.”

**GREATER CARE FOR THE REGION’S SMALLEST PATIENTS**

Plans for a new pediatric pavilion capped a busy 2011 for the Children’s Hospital at VCU and will make the hospital the largest, most advanced out-patient facility dedicated to children in the region. Sited to house 72 clinical exam rooms organized for multidisciplinary care, a surgical area with operating and procedure rooms, as well as clinical spaces for testing, X-rays, lab services and more, the pavilion will centralize the majority of pediatric treatment and diagnostic services currently spread throughout the VCU Medical Center and will create a child- and family-friendly experience for visitors.

These plans come on the heels of CHoR opening its new Center for Endocrinology, Diabetes and Metabolism on Parham Road in Richmond’s West End, bringing together clinical, specialized and educational support services for children with diabetes, obesity and other endocrine disorders. Recertified in 2011 by the American Diabetes Association (ADA), the center remains the only pediatric ADA-certified program in Central Virginia, and, with the new facility, it is the region’s only endocrinology center to offer treatment, clinical trials, education, medical nutrition therapy and psychological support in one location.

Additionally, 2011 witnessed the expansion of CHoR’s Adolescent Health Services, which provides continuity of care to patients, aged 12 to 22, with acute and chronic medical problems, behavioral concerns, musculoskeletal issues, skin problems and other endocrine disorders. Recertified in 2011 by the American Diabetes Association (ADA), the center remains the only pediatric ADA-certified program in Central Virginia, and, with the new facility, it is the region’s only endocrinology center to offer treatment, clinical trials, education, medical nutrition therapy and psychological support in one location.

A collaborative effort among VCU’s School of Nursing, the Richmond City Health District (RCHD), the Richmond Redevelopment and Housing Authority (RRHA) and the Mosby Resource Center helped launch a new neighborhood health center in downtown Richmond.

Located just blocks from VCU in an underserved RRHA district, the Mosby Resource Center offers a community- and relationship-based approach to promoting wellness through a variety of services, including health screenings, checkups and health and nutrition education. Through partnering with organizations such as the RCHD, Fan Free Clinic and Peter Paul Development Center, as well as the Richmond Memorial Health Foundation and the Virginia Health Care Foundation, the center also provides access to quality health care.

The new Mosby Resource Center joins existing resource centers in RRHA’s Creighton, Fairfield and Whitcomb communities, where School of Nursing students provide clinical services as a part of their required nursing school course work.

"The goal is to help the citizens in the community not only improve their health care, but also learn how to navigate the health systems in the Richmond metro area," added Stephanie L. Ferguson, Ph.D., R.N., FAAN, associate professor and director of the Community Nursing Organization in the nursing school.

"I hope we will have a positive impact on the community by providing increased access to prevention, wellness and chronic care management services.”
A NETWORK FOR NAVIGATING MENTAL HEALTH SERVICES

In Virginia, fewer than 100 psychiatrists specialize in adolescent and child psychiatry, yet there are 200,000 children in need of psychiatric help, which too often leads to confusion, long waits and misinformation in terms of where families need to go to get the help they need.

“We did not want the center to become another place where Richmond families go for answers and then have to wait three months,” said Robert Cohen, M.D., director of the VTCC. “Here, we hope a child can be seen by a professional within a week or two.”

Using a referral network of mental health care providers and pediatric offices, CMHRC can help connect families with the appropriate advocacy and financial services resources, as well as provide consultation, monitoring and ongoing opportunities for family members to learn more about conditions, diagnoses and treatments.

The name of one of the nation’s pioneering cardiologists, Charles L. Baird Jr., M.D., is woven through much of the VCU Medical Center’s Baird Vascular Institute, which opened in October and can be found in Richmond’s near West End.

The institute offers a multidisciplinary approach to vascular disease and other conditions by providing diagnosis and treatment of everything from aortic aneurysms and vascular body compression fractures to placement of catheters and an array of cosmetic procedures. Fittingly, Jane B. Baird Hyde bequeathed the building and land in memory of her late husband, who passed in 2008. So, the space where Baird performed such groundbreaking work as the first cardiac catheterization in an outpatient setting will continue to be the site of future breakthroughs in vascular research and treatment.

In addition to patient care, the Baird Vascular Institute will be dedicated to patient and community education through the creation of a community room on the second floor, which offers a location for health lectures and other outreach efforts.

THE HEART OF A LEGACY IN A NEW VASCULAR INSTITUTE

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THE VCU MEDICAL CENTER WELCOMED ITS NEWEST BATCH OF FIRST-YEAR RESIDENTS LAST JUNE WITH ITS SECOND ANNUAL WALK-THE-WALK CONFERENCE, DESIGNED TO IMMENSELY FASHION AND FOSTER TEAM-BASED CARE THROUGH INTERDISCIPLINARY TRAINING SESSIONS THAT PUT SAFETY AT THE HEART OF THEIR CLINICAL RESPONSIBILITIES.

Because residents come from more than 55 medical schools across the country, the program’s creators — Mary Alice O’Donnell, Ph.D., associate dean of the medical school’s Graduate Medical Education Office; Stephanie A. Call, M.D., M.P.H., director of the Internal Medicine Training Program, and Shauna J. Perry, M.D., director for Patient Safety Systems Engineering — worked with residency program directors from different specialties to identify key concepts and behaviors fundamental for safe medical practice. Through case-based discussions, as well as team activities and simulations, residents are able to familiarize themselves with what’s expected of them not only in health care providers, but also as members of a team of health care professionals.

“Integrating this curriculum into interns orientation is a meaningful step forward on our journey to become America’s safest health system,” O’Donnell said.

REWARDING CONFIDENT CARE AT CELEBRATED BURN CENTER

The Evans-Haynes Burn Center, the oldest civilian burn facility in the U.S., received recognition for its dedication to providing optimal care for its patients from one national source, as well as a few local ones. Early in 2011, the American Burn Association and the Committee on Trauma of the American College of Surgeons verified the burn center on the basis of its criteria regarding burn care capability and institutional performance, confirming its commitment to quality care.

Then, in September, VCU’s men’s basketball head coach Shaka Smart visited patients and staff at the burn center, bringing along sophomore Rob Brandenberg and freshmen Treveon Graham and Bruce Weber, all in an effort to praise the work of the center, learn more about how it operates and to involve student-athletes off the court and in the community.

“It’s really a humbling thing when we go out and are able to put a smile on people’s faces,” Brandenberg said. “It’s something that we all love to do, to be able to show our appreciation for the support that not only the VCU community, but all of Richmond, has shown our team.”

GOING TO BATTLE AGAINST PARKINSON’S

VCU celebrated the opening of its Parkinson’s and Movement Disorders Center, one of the very few of its kind in the U.S. Under the leadership of James P. Bennett Jr., M.D., Ph.D., the Bemiss Endowed Chair in the Department of Neurology, the multidisciplinary center moves groundbreaking research from novel approaches in the laboratory to clinical trials, translating discoveries into treatments for patients.

“There is a demand for comprehensive evaluation for people with this complex disease,” Bennett said. “Patients with Parkinson’s have many needs. The center will look at the complete person and provide a total, comprehensive evaluation.”

The center also combines research, education and outreach to develop strategies that combat neurodegenerative and movement disorders. A major goal of the center is to advance the understanding of Parkinson’s disease in terms of defining biological causes and developing new treatments.

AN EARLY-WARNING SYSTEM TO DETECT LUNG CANCER

The VCU Medical Center launched its comprehensive Lung Cancer Screening Program in August in an attempt to curb the leading cause of cancer death in both men and women in the U.S. Featuring a multidisciplinary team of thoracic and interventional radiologists, cardiology surgeons, pulmonologists and smoking-cessation experts, the program takes aim at detecting lung cancer sooner and providing the necessary resources for treatment, education and patient support.

Though prevalent, lung cancer is difficult to detect, and few early warning signs exist. As a result, most patients fail to see a physician until they have already begun showing advanced symptoms. Historically, chest X-rays have been used for detection purposes; however, the smallest cancers detected by that method are already in the later stages of the disease.

By using low-dose helical CT scans, providers may be able to detect lung cancer at an earlier stage in high-risk patients, such as those who are or once were heavy smokers. Along with being painless and fast, the CT scan requires a low dose of radiation, no need for patient preparation, no IV and no contrast or dye material.

VCU’s Lung Cancer Screening Program was approved by data generated by the National Cancer Institute in 2010, which showed high-risk individuals who received at least three annual low-dose helical CT scans had a reduced risk of dying from lung cancer when compared with those who received standard annual chest X-rays alone.

FIRST-YEAR RESIDENTS WALK-THE-WALK

The VCU Medical Center welcomed its newest batch of first-year residents last June with its second annual Walk-the-Walk conference, designed to immerse these young physicians in the medical center’s culture and foster team-based care through interdisciplinary training sessions that put safety at the heart of their clinical responsibilities.

Because residents come from more than 55 medical schools across the country, the program’s creators — Mary Alice O’Donnell, Ph.D., associate dean of the medical school’s Graduate Medical Education Office; Stephanie A. Call, M.D., M.P.H., director of the Internal Medicine Training Program, and Shauna J. Perry, M.D., director of Patient Safety Systems Engineering — worked with residency program directors from different specialties to identify key concepts and behaviors fundamental for safe medical practice. Through case-based discussions, as well as team activities and simulations, residents are able to familiarize themselves with what’s expected of them not only in health care providers, but also as members of a team of health care professionals.

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INTERVIEW WITH A STANDARDED PATIENT IN THE SCHOOL OF NURSING’S SIMULATION LAB

At the 201 1 annual report
New campus, same academic excellence

In 2002, Anita Bakshi, M.D., now a gastroenterology fellow at George Washington University Hospital, found herself still mulling options for medical school. However, once the Northern Virginia native learned of the VCU School of Medicine’s plans to partner with Inova Fairfax Hospital and develop a branch campus near her hometown, she said she didn’t bother to send in any other applications.

Those plans came to fruition in August 2005 — the culmination of eight years of discussions among VCU, state and Inova officials, as well as comprehensive planning efforts led by Craig Cheifetz, M.D., associate dean for medical education and student affairs at VCU’s Inova Campus and director of undergraduate medical education for the Inova Health System.

Since that inaugural class of 24 students (of which Bakshi was a member), the Inova program has grown to include 31 students, and Cheifetz said demand is so high (usually twice the allotted class size) that Inova plans to increase its student body to 48, in addition to the 20 students the School of Pharmacy sends each year through its own affiliation with Inova.

Part of the reasoning behind that demand, Bakshi contends, is the one-on-one time and personalized attention she was able to get through working closely with Inova’s residents, attendings and administrators.

"The deans and physicians created an environment where you wanted to wake up and go to work, which helped me to foster some of my strongest friendships and personal relationships," Bakshi said. "Inova provided me with the medical knowledge, technical skills, professionalism and confidence to become a successful physician today."

Solidifying NCI status

Seven years ago, VCU set its sights on advancing its Massey Cancer Center to National Cancer Institute comprehensive cancer center status, the world’s most prestigious honor in oncology. In June 2011, the university took one giant step toward that goal by recruiting Steven R. Grossman, M.D., Ph.D., an internationally renowned scientist and expert in gastrointestinal cancers. Grossman is just one of 94 additional full-time faculty members resulting from Presidential Excellence Funds. This move not only fortifies Massey’s current status as an NCI-designated Cancer Center, but it makes comprehensive status a real possibility.

For more on these stories, visit www.vcuhealth.org/annualreport.
2011 rankings of Graduate-Professional Students. The National Association is ranked in the top quartile in the latest ranking cycle for those disci- plines, respectively, during the March 2011 its County Health project, however, examined only the role education plays on avertable deaths, but can also help the environment. Dispensing of medications not only ing, but can also help the environment. In 2010, Americans turned in a total of more than 120,000 tons of pills during the final day of Take Back Day. During the two events in 2011, an additional 388 tons of medication were collected and safely discarded. As a result, the program will then be made available to other institutions to use.

COLLABORATIVE EDUCATION FOR GERIATRIC CARE

The VCU School of Pharmacy’s Phi Delta Chi professional fraternity, in conjunction with the VCU Police Department, and the National Take Back Initiative to help people in Richmond properly dispose of expired or unused medications. According to organizers, properly disposing of medications not only helps prevent drug abuse and poison- ing, but can also help the environment. In 2010, Americans turned in a total of more than 120,000 tons of pills during the final day of Take Back Day. During the two events in 2011, an additional 388 tons of medication were collected and safely discarded.

Students who participated in the events reported that some drugs they collected dated back to the 1970s.

THE FUTURE OF PHARMACY

The VCU School of Pharmacy brought together pharmacy experts from across North America at the Pharmacy Practice in the Commonwealths of Virginia. The Practice Transformation Conference in June. The daylong conference pro- vided a forum for discussion among practice leaders, student pharmacists and faculty to identify and investigate the many opportunities the pharmacy profession now has to become more engaged in improving access to and quality of health care — with an emphasis on medication-related health outcomes — as well as reducing health care costs. Keynote addresses, plenary speakers and small-group forums helped bring into focus recent health care reforms at the national and state level in addition to identifying key elements for integrating innovative and sustainable phar- macy practice models in various Virginia health care settings.

LEADING THE PACK IN HEALTH SCIENCES

VCU capped the decade with a flurry of top national endorsements, high- lighted by the School of Allied Health Professions’ Nurse Anesthetist program’s No. 1 billing in the U.S. News & World Report 2011 rankings. Additionally, the school’s health services administration and rehabilita- tion counseling programs earned top-10 spots, while the occupational therapy program earned a top-20 spot. Medical school pro- grams garnered top 15 and top 25 distinctions, respectively, during the latest ranking cycle for those disci- plines in 2011. Between the 2008 and 2011 rankings, the schools of Nursing and Pharmacy each carried top 40 and top 25 designations, respectively, and the Ph.D. in Health Related Sciences program continues to be the only interdisciplinary, Web-based doctoral program in the country and is ranked in the top quartile in the nation by the National Association of Graduate-Professional Students.

TOMORROW’S MEDICAL TRAINING— FROM THE GROUND UP

VCU officials and Virginia Gov. Bob McDonnell announced in April 2011 a $15 million donation to the School of Medicine by James and Frances McGlothlin, one of the largest in the university’s history, and one that will help support construc- tion of the school’s new medical education building. The McGlothlins made the donation in recognition of Harold F. Young, M.D., professor, founding chair of the Department of Neurosurgery and director of the Harold F. Young Neurosurgical Center at the VCU Medical Center. And, for their continued support of the School of Medicine, officials also announced that the medical education building, slated to open in spring 2013, will be named the James W. and Frances G. McGlothlin Medical Education Center. The 12-story, 300,000-square-foot building will bring together faculty, medical students, residents and practicing physicians in a state-of-the-art training hub designed to support the most significant curriculum innovation across the spectrum of medical education the school has made in the past three decades. The $158.6 million building also will enable the school to accommodate a larger class size, up from 200 to 250, increasing the total medical student body to 1,000, which officials said they hope can help address local, state and national physician shortages.

HIGHER INCOME, HIGHER EDUCATION, LOWER HEALTH RISKS

The VCU Center on Human Needs, together with the Robert Wood Johnson Foundation, unveiled in March 2011 its County Health Calculator, a new online simulation tool that allows users to examine how mortality would be affected if more favorable socioeconomic conditions, particularly levels of education and income, existed in a certain county, state or the entire U.S. The project is an extension of a tool developed by Steven H. Woolf, M.D., M.P.H., director of the Center on Human Needs and professor in the Department of Family Medicine, and Robert E. Johnson, Ph.D., associate professor in the departments of Biostatistics and Family Medicine. That project, however, examined only the role education plays on avoidable deaths, and while the new County Health Calculator adds income as a determin- ing factor, Woolf stressed that the focus on income is not restricted to poverty. “The message applies to rich or poor: income, education and the opportunities they bring, are not just important for jobs and livelihoods — they are important for health,” Woolf said. For example, according to the Robert Wood Johnson Foundation’s 2011 County Health Rankings project, income is an important factor in improving health as measured by the health of the population. However, the study also found that while higher incomes are associated with better health outcomes, they are insufficient to meet the health care demands of such a burgeoning popu- lation. By screening for undiagnosed conditions such as hypertension and diabetes, organizations said they hope to stave off more serious health problems, such as cardio-metabolic diseases, for which members of the Hispanic community are at an increased risk.

TRANSLATING GOOD HEALTH

Students in the schools of Medicine, Nursing and Pharmacy participated in numerous health screening and fundraising events for Una Vida Sana (which means “A Healthy Life” in Spanish) — a project started in 2009 that provides multidisciplinary service-learning opportunities for students while collaborat- ing with CrossOver Health Care Ministry and Richmond’s Hispanic Liaison Office to improve the health of the city’s Hispanic community. According to organizers, the Hispanic population in the Greater Richmond area has increased rapidly since 2000, and existing resources are insufficient to meet the health care demands of such a burgeoning popu- lation. By screening for undiagnosed conditions such as hypertension and diabetes, organizers said they hope to stave off more serious health problems, such as cardio-metabolic diseases, for which members of the Hispanic community are at an increased risk.

CARE BEYOND BORDERS

Nine members of the VCU chap- ter of Nursing Students Without Borders (NSWB) traveled to Central America in January to provide health screenings and educational outreach for rural populations in the highlands of Guatemala. With a focus on primary preven- tion, the students provided lectures and screenings on diabetes, illi- ness, as well as to educate people about the importance of hydration in children and children and women. “I don’t think I will ever meet a more amazing group of people than those that joined me on this trip, those that made this trip possible and those that I met in Guatemala working hard to empower our communities,” said VCU’s NSWB President Danielli Viggiano. “It was an unforgettable experience, one I plan to have NSWB be a part of again next year.”

The VCU School of Pharmacy’s Phi Delta Chi professional fraternity, in conjunction with the VCU Police Department, and the National Take Back Initiative to help people in Richmond properly dispose of expired or unused medications. According to organizers, properly disposing of medications not only helps prevent drug abuse and poison- ing, but can also help the environment. In 2010, Americans turned in a total of more than 120,000 tons of pills during the final day of Take Back Day. During the two events in 2011, an additional 388 tons of medication were collected and safely discarded.

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How can VCU train future providers to integrate into, as well as lead, a health care system that promotes to be more team-based and interactive? Thanks to a two-year, $300,000 award from the Josiah H. Macy Jr. Foundation, which named him one of five medicine and nursing faculty members nationwide in its first class of Macy Faculty Scholars last summer, that’s exactly what Alan Dow, M.D., assistant professor and assistant dean of medical education in the Department of Internal Medicine, is trying to determine.

“ar have traditionally trained health care workers separately, and then we ask them to work together as a team. In interprofessional education, we bring the disciplines together to learn how they can collaborate better as a team,” Dow said. “Studies have shown interprofessional care — when done well — improves patient outcomes. It will improve health care for patients and also make health care workers happier in their jobs.”

Dow’s project looks at how increased collaboration among health professionals can improve patient care and how to teach team-based competencies that foster effective interprofessional practice. He will create an interprofessional curriculum that other institutions can use, providing them with a toolkit for instruction and assessment to ensure successful adoption.

In just the past six years, Dow, who was featured in the March 2012 U.S. News & World Report, for his work in interprofessional education, has created several unique programs that have significantly enhanced the learning experience of medical school students and residents.

**CORNERSTONE OF COLLABORATION**

VCU’s Institute for Drug and Alcohol Studies earned a five-year, $1 million renewal grant supporting the Hubert H. Humphrey Fellowship Program, which brings substance abuse professionals from designated countries in Africa, Asia, Latin America, the Caribbean, the Middle East and Europe to the U.S. for a year of study and related professional experiences, including advanced leadership training that combines academic, practical and cultural activities.

**TAKING AIM AT SUBSTANCE ABUSE**

The School of Pharmacy’s Department of Family Medicine has selected 11 scholars from across the country to participate in the Grant Generating Project (GGP), a yearlong program based at VCU designed to better equip and mentor family medicine researchers with grant-writing skills.

The project was established in 1995 and brings health professionals to VCU for two semesters of study and related professional experiences to increase research capacity in securing competitive funding for grants and contracts in the discipline of family medicine. Scholars also learn to write successful research grants and network with family medicine researchers throughout North America.

Organizational sponsors of the project include the American Academy of Family Physicians Foundation, the North American Primary Care Research Group and the Society of Teachers of Family Medicine. To date, GGP alumni have reported more than $136 million in funded grants as either principal investigators, co-investigators or in other significant roles, since participating in the program.

Melissa Bradner, M.D., M.S.H.A., associate professor of family medicine at VCU, earned one of the fellowships and will be joined by health care professionals from as near as Charlotte, N.C., and as far as Oregon and California.

**RESEARCH BOOST FOR FAMILY DOCTORS**

**STUDENT ENROLLMENT**

*Includes oncampus and offcampus enrollments.
SCHOOL OF PHARMACY REACREDITED

VCU’s School of Pharmacy earned reaccreditation in February 2011 following a fall 2009 site visit by the Accreditation Council for Pharmacy Education. As a result, the School of Pharmacy remains the only pharmacy program in Virginia with a six-year accreditation, the maximum amount of time granted between accreditation visits. “I am very pleased that we met all accreditation standards and were given a full six-year accreditation,” said School of Pharmacy Dean Victor Yanchik, Ph.D., the Archibald Owens McCally Endowed Chair.

My hat’s off to the faculty, staff and students who made this happen.”

The School of Pharmacy has been continuously accredited since the ACPE began accrediting pharmacy schools in the 1930s.

ANSWERING THE BELL

Second-year medical student Alicia Bell has been elected to an extremely competitive national leadership position with the American Medical Student Association (AMSA), an entirely student-governed organization committed to representing the concerns of all physicians-in-training.

In addition to this post, Bell serves as a Student Government Association representative for the second-year class and on the board of directors for the National Women’s Health Network. She also is involved with the Student Family Tent related to standards of professionalism in the medical education setting to AMSA’s members throughout the year.

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FROM HIGH SCHOOL STUDENT TO HOSPITAL DOCTOR

VCU’s drive to teach the next generation of medical professionals extends beyond its own residents and intern. In fact, it reaches even beyond its whole student body. Through the Virginia Governor’s School for Life Sciences and Medicine, sponsored by VCU Life Sciences, up to 30 high school juniors and seniors are given the chance each summer to see firsthand what it really takes to be a physician.

Through three weeks of intensive classroom-based case studies, students are asked to play the physician’s role by obtaining medical histories, developing differential diagnoses, selecting diagnostic tests, interpreting physical exam findings and lab results and, ultimately, creating a treatment plan. Along the way, they pick up molecular techniques, problem-solving diagnostics and an understanding of public health and epidemiological statistics.

However, the capstone of the experience is the three days they spend shadowing doctors as they visit with patients, work with other doctors, perform procedures and round through the ICU. Only then can they say whether the field of medicine is one they truly want to pursue.

DENTAL IMPLANTS MAPPED WITH GUIDED PRECISION

The VCU School of Dentistry became one of the first in the nation to use image guided implantology (IGI) in an effort to make dental implant procedures safer and more precise. Rather than relying solely on X-rays and what they can observe in the patients themselves, dentists use the computer program to give them a clearer understanding of where to drill (as well as what sensitive vital structures and nerves to avoid) much like a GPS system.

Training residents to perfect the technique takes about three months, and IGI is already in use in the Graduate Periodontics and Oral Surgery clinics. The dental school also uses Image Navigation’s first product, DentSim, as a learning tool for dental students and for continuing education. DentSim technology gives users real-time feedback through an advanced software program that monitors users’ activity. The IGI software can be used in the DentSim laboratory to train dental students as well.

PATIENTS ACTING OUT REAL LIFE

Twenty-three actors trained by the Department of Theatre made their debut as standardized patients during the School of Medicine’s new intern orientation in June, a one-of-a-kind partnership with the Center for Human Simulation and Patient Safety designed to build upon the growing body of research showing the effectiveness of the arts in medical education.

As standardized patients, actors have been carefully coached to simulate actual patients so accurately that the simulation cannot be detected by a skilled clinician, and they’re able to present the entire gestalt of the patient—not just the history, but also the body language, physical findings and emotional and personal characteristics. As the program evolves, the cases can be customized according to the needs of different departments and specialties, and the program may also be used to develop ways to assess the interpersonal communication skills of students. Similarly, officials hope to increase the pool of standardized patients to 100 to 150 and establish a bank of common cases. They also plan to disseminate these tools for other institutions to use in their training.

A SIMULATED FAMILY CIRCLE

The School of Nursing’s Clinical Learning Center (CLC) welcomed in September one of the newest pediatric simulation centers in the industry to its growing interactive education inventory, cementing its status as one of the most comprehensive clinical simulation centers on the East Coast.

Its newest acquisition, the SimJunior, tallies, breathes, has a pulse and is about the size of a 5-year-old, meaning the CLC now has a multigenerational “family” of patient simulators, including five adults, one genuine patient, one infant and one newborn.

The SimJunior software allows instructors to tailor training to meet individual needs through its user interface and scenario design. Instructors can control the SimJunior’s responses during a training session with the push of a button, a handheld remote or a laptop to create basic or advanced scenarios. Similarly, the SimJunior is able to give immediate feedback back to students so they can think critically and adjust their care plans accordingly.

Medical students in a patient simulation exercise.

The 2011 annual report
Going grassroots with science

With the help of nearly $3.5 million in funding since 2008 from the Virginia Tobacco Indemnification and Community Revitalization Commission, VCU Massey Cancer Center researchers have been able to engage communities most affected by cancer in Southside Virginia at the ground level. While that money funded a handful of projects — including a health economics study, a series of smoking-cessation public service announcements and a lifestyle and cancer survival study — chief among them was a needs assessment, which relied on community liaisons to facilitate surveys, lead focus groups and assess cancer burdens, which can now lay the groundwork for future cancer research, prevention and control.

Translating discoveries into care

In 2010, VCU received the single largest federal grant in its history — a $20 million Clinical and Translational Science Award (CTSA) from the National Institutes of Health. In the year that followed, the Center for Clinical and Translational Research (CCTR), home to VCU’s CTSA grant, firmly took its place among an elite consortium of 60 nationally prominent research institutions all focused on the importance of translational science.

“This has been an exciting year for the VCU Center for Clinical and Translational Research as we build and strengthen the bridge between basic science research and clinical applications,” said John Clore, M.D., director of the CCTR and professor in the Department of Internal Medicine.

Today’s medical translational research requires a collaborative, cross-disciplinary approach involving experts in many fields of study. At VCU, researchers from across the university receive support from the CCTR in multidisciplinary research and benefit from Web-based data sharing, training and access to a rich array of resources, including a Research Incubator, Biomedical Informatics and Research Resources, and a central home for managing clinical trials.

Other key CCTR components focus on identifying community-based needs to drive research efforts as well as an education program that trains a new generation of researchers. Together, these cores enable the CCTR to create a culture of collaborative research at VCU and to work with other CTSA institutions to transform the research and training environment to enhance the efficiency and quality of clinical and translational research.

“Much work has been done in the first year of the grant to coordinate our teams and services that we provide to faculty, community members, patients and students,” Clore said. “I am very excited about the transformative potential this groundwork over the past year will foster in innovative and advanced scientific research that will ultimately improve the delivery of health care that helps patients in our community and around the world.”

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For more on these stories, visit www.vcuhealth.org/annualreport.
The Carnegie Foundation’s Commission on Higher Education has elevated VCU’s classification status to “Very High Research Activity,” which, combined with its “Community Engaged” designation, makes VCU just one of 28 public universities in the country with elevated research statuses as defined by the Carnegie Foundation.

The elevation in research status can be traced primarily to VCU’s efforts throughout the past decade to expand its research programs as it moved toward its current $756 million in sponsored research — an effort punctuated in July 2010 by a $50 million Clinical and Translational Science Award from the NIH to become part of a nationwide consortium of research institutions working to turn laboratory discoveries into treatments for patients.

VCU’s community engagement status has long been recognized by the foundation as the university was selected for the Community Engagement Classification in 2006.

Research into the ways medicinals are transported into and out of cells is vital to understanding things such as drug resistance, efficacy and safety. With such knowledge, researchers can more effectively identify adverse medication interactions and develop better drug combinations for a variety of treatments.

Through support from the NIH, School of Pharmacy researchers in particular are studying the role the kidneys play in eliminating drugs and plant-derived toxins, which can cause kidney disease and failure. Aristolochic acid (AA) is one such toxin that targets the kidneys, and by looking at the proteins responsible for allowing the transport of that substance into the kidneys, known as organic anion transporters (OATs), researchers found that OATs recognize AA with high affinity, which allowed for greater distribution of the toxin in the kidneys.

By introducing OAT inhibitors, researchers found that aristolactam-DNA adducts, which serve as biomarkers for intracellular accumulation of AA, were reduced in kidney tissue by more than 90 percent, suggesting that blocking access to OATs can mitigate renal damage caused by exposure to such toxins.
THE MARK OF PERSONALIZED BREAST CANCER CARE

A new biomarker related to the body’s immune system discovered by Massey researchers can predict a breast cancer patient’s risk of cancer recurrence and may lead to new genetic testing that further personalizes breast cancer care.

The study, published in the journal Breast Cancer Research and Treatment, is the first to use tumor-infiltrating immune cells—located at the site of the tumor to predict cancer recurrence.

“Our test differs from currently used tests by looking for a biological response to the presence of cancer and not relying on genes expressed by the actual cancer cells,” said the study’s lead researcher, Manjil Masal, D.V.M., Ph.D., assistant professor of microbiology and immunology. “Our findings could lead to clinical trials that test whether using immunotherapy prior to conventional treatments to breast cancer patients with a high risk of relapse could prime the patients’ immune systems, much like a vaccine, to prevent the likelihood of relapse.”

In another lab study directed by Manjil, researchers have discovered a way to improve adoptive cellular therapy (ACT) for breast cancer. ACT boosts the immune system’s ability to detect and destroy cancer through an infusion of T cells programmed to target specific cancer markers; however, the effectiveness of ACT is limited by myeloid derived suppressor cells (MDSCs), which block the ability of T cells to attack tumor cells.

By including natural killer T (NKT) cells, researchers said ACT can overcome MDSCs, as NKT cells act as a bridge between the innate and adaptive immune systems. Researchers found they could reprogram T cells and NKT cells to develop a long-lasting memory for rejecting breast cancer cells and guard against tumor relapse.

The researchers obtained a grant from the Commonwealth Health Research Board to test this approach using peripheral blood obtained from breast cancer patients, and they said they’re optimistic the data from this future study will provide the push for the initiation of a Phase II/III clinical trial.

CALL FOR CHANGE IN ONCOLOGY

School of Nursing researchers have partnered with VCU Health totaling more than $1.5 million to support the early detection and management of breast cancer through discussions with two ongoing projects led by principal investigator Debra Lyon, Ph.D., R.N., FNP-BC, FNP, FAAN, the Judith B. Collins and Joseph M. Teefey Distinguished Professor and chair of the Department of Family and Community Health Nursing.

By examining the role that changes in go function play in the development of frequently reported psychosocial problems — such as depression, anxiety, fatigue, and pain — in women undergoing treatment, researchers seek to provide a foundation for the development of predictive markers.

Until then, however, effective management of these symptoms remains critical and researchers are exploring unravel electric stimulation (ACES) as a complementary form of care for breast cancer patients. Researchers said ACS is a noninvasive, portable and easily standardized approach to re-establish optimal neurotransmitter levels and functioning in the brain.

Supported by funding from a V Foundation Translational Research Award and the NHI, the trial included 36 patients who had either indifferent (inconclusive) or negative (nonaggressive) Ki-67 results. Treatment began when the study started, and patients were randomized into two groups. The first group was treated with ACS and the second group was a control group.

However, when researchers analyzed the data, they found that the group that received ACS twice a week for eight weeks had a significant decrease in symptoms of depression, anxiety, fatigue and pain compared to the control group. The symptoms of depression, anxiety, fatigue and pain were measured using the Brief Pain Inventory and the Brief Symptom Inventory.

TREATING THE SYMPTOMS OF TREATMENT

TOO MANY SCREENING OPTIONS TOO OFTEN AVOIDED

Massey researchers, led by Reza M. Jones, M.P.H., Ph.D., assistant professor in the Department of Epidemiology and Community Health, have found that patients presented with multiple colorectal cancer screening recommendations are more likely to be confused by their options and are therefore more likely to neglect those recommendations.

The study, funded by the National Cancer Institute (NCI) and published in the journal Cancer Epidemiology, Biomarkers & Prevention, used questionnaire data from 1,350 patients 50 to 75 years old who visited their doctor at least once in the past two years. Researchers found that 36 percent of respondents who had discussed two or more colorectal cancer screening options were 1.8 times more likely to be confused than those presented with one screening method and were 1.8 times less likely to follow screening recommendations.

Because there are multiple methods of screening for colorectal cancer, which can range in cost, frequency, accuracy and discomfort, researchers said the data generated in this study highlights that, while patients must still be given choices regarding their treatment, making sure they understand those choices is paramount.

Since screening is the most effective way to diagnose colorectal cancer, which is the second leading cause of cancer death, researchers said they plan to further explore socio-economic factors that may contribute to patient confusion about colorectal cancer screening in the hopes of conducting a randomized trial to increase screening.

THE MARK OF PERSONALIZED BREAST CANCER CARE

VCU announced in August its largest-ever gift of $85 million, part of a multi-million dollar trust created by Arthur Graham and Margaret Branch Glasgow before their death that also includes the money to the Virginia Museum of Fine Arts and 11 other Richmond, Va., charities.

VCU’s portion of the trust will be used to support the prevention and care of cancer and other degenerative diseases, and Michael Bax, Ph.D., president of VCU and the VCU Health System, called it “the kind of gift that helps elevate a university to a new level.”

“A major research university, a gift of this magnitude enables us to support the people, facilities and programs necessary to make a difference in peoples’ lives and in the health of our community,” he added.

A GIFT FROM THE PAST TO SUPPORT FUTURE THERAPIES

TO DRUG COMBO RESULTING IN PLEASANT SIDE EFFECTS

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DECADE OF DIFFERENCE THE 2011 ANNUAL REPORT

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THE WEAK SPOT IN MULTIPLE MYELOMA DEFENSE

Attacking cancerous cells while limiting damage to the body’s healthy ones remains a challenge, but in the case of multiple myeloma, a form of bone marrow cancer, Massey scientists have developed a new strategy to do just that.

Researchers found they could inhibit prostate cancer by sensitizing the cancer cells with the drug sabutoclax and sets of inhibitors used together dramatically increased cancerous cell death while exerting little effect on healthy cells. With these findings, researchers said they’re prepared to develop further trials and future clinical studies, which could lead to entirely new therapies for this typically incurable disease.

For this research was provided by grants from the NCI, the Multiple Myeloma Foundation, the V Foundation for Cancer Research and a Specialized Programs of Research Excellence award.

MITOCHONDRIA: A MIRROR OF POSSIBILITIES

Massey researchers stand on the cusp of potential gene therapies to treat cancer and age-associated disease like Parkinson’s, heart disease and hypertension—thanks to their discovery of novel mechanisms in mitochondria.

In the nucleus of mammals, a series of genetic on/off switches are triggered to determine which genes get expressed, thereby establishing the biologic characteristics of a particular cell, which is known as DNA methylation. Led by Shirley Taylor, Ph.D., Massey researcher and associate professor in the Department of Microbiology and Immunology, researchers have found that a system of gene control similar to what occurs in the nucleus of a cell is also present in mitochondria, functioning to ensure that correct levels of proteins needed for proper energy generation are present.

“In diseases such as cancer, genes that should be silenced on are switched off and vice versa, leading to uncontrolled growth,” Taylor said. “Our research indicates that errors in gene expression could be unfolding in mitochondria, possibly contributing to loss of mitochondrial function typical of cancer and a host of other age-related diseases.”

Taylor’s team is currently working to observe whether these errors in gene expression impact mitochondrial ability to generate energy. Additionally, researchers are also comparing the amount of DNA methylation in diseased cells versus healthy cells to determine whether mitochondrial gene expression plays a role in various other diseases.

This research was funded by the NCI and by a pilot project award from Massey.

EXPANDED EFFORTS TO MOVE MASSEY FORWARD

Virginia Gov. Bob McDonnell and the General Assembly approved $5 million in state appropriations to VCU’s Massey Cancer Center — a boost that will help the center expand its research endeavors and hopefully bring it one step closer to earning NCI Comprehensive Cancer Center status.

At the highest level of distinction a cancer center can receive, comprehensive status would make Massey one of only 42 equally designated centers in the country and the only one in the state with this designation.

Massey has been designated by the NCI for the past 35 years because of its accomplishments in cancer research and its role in reducing cancer morbidity and mortality. It is one of only two centers in the state with this designation.

PUSHING PROSTATE CANCER TO THE EDGE

Researchers with Massey and the Institute of Molecular Medicine in the School of Medicine may be a step closer to finding a cure for advanced prostate cancer after effectively combining an anti-cancer drug with a viral gene therapy.

Researchers found they could inhibit prostate cancer by sensitizing the cancer cells with the drug sabutoclax and by using ultrasound-targeted microbubble-destruction technology to deliver a viral gene therapy that expresses the gene mdm-7/IL-34.

Sabutoclax works by inhibiting the protein Mcl-1, known to promote cell survival by preventing a form of cell suicide known as apoptosis, while the gene mda-7/IL-24 increases apoptosis in tumor cells and regulates cellular immune response.

“This research was funded by grants from the NCI, the Multiple Myeloma Foundation, the V Foundation for Cancer Research and a Specialized Programs of Research Excellence award.”

A BETTER LOOK AT BRAIN TUMORS

According to findings from VCU and Virginia Tech, a single compound with the ability to simultaneously deliver effective treatment and imaging may one day be used to enhance the diagnosis, imaging and treatment of glioblastoma, the most common and aggressive form of brain tumors in humans.

Because these tumor cells, which have a high rate of relapse, often extend beyond the well-defined tumor margins, it’s extremely difficult for clinicians and radiologists to visualize them with current imaging techniques. However, researchers found that a nanoparticle-filled gadolinium (a sensitive MRI contrast agent used for imaging), coupled with radioactive lutetium 177, can effectively be imaged within the tumor as well as provide radiation therapy.

Researchers said the properties of this nanoparticle prolong its retention within a tumor, allowing a higher dose of radiation to be delivered locally, which can help slow or delay relapse. Although this study, funded by grants from the NIH and the National Science Foundation, was limited, researchers said they hope the platform can soon be extended to humans.

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CONTROLLING ALZHEIMER’S

Four VCU professors received grants through the 2011-12 Alzheimer’s and Related Diseases Research Award Fund to study the control and prevention of neurological disorders.

Malgara Dukat, Ph.D., associate professor in the Department of Medicinal Chemistry, and Gala R. Abdulkhalemovna, M.D., Ph.D., assistant professor in the Department of Pharmacology and Toxicology, are researching ways to treat the imbalance of acetylcholine (ACh), a neurotransmitter found in the brain, related to Alzheimer’s. They’ve identified MD-354 as a molecule that can potentially block the effect of ACh at receptor sites. In contrast to current inhibitors that are limited to symptomatic treatment of cognitive function, these agents offer the potential to slow Alzheimer’s progression.

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This research was funded by the National Institute on Aging and the National Institute on Drug Abuse.

A BETTER LOOK AT BRAIN TUMORS

Researchers found that a nanoparticle-filled gadolinium (a sensitive MRI contrast agent used for imaging), coupled with radioactive lutetium 177, can effectively be imaged within the tumor as well as provide radiation therapy.

Researchers said the properties of this nanoparticle prolong its retention within a tumor, allowing a higher dose of radiation to be delivered locally, which can help slow or delay relapse. Although this study, funded by grants from the NIH and the National Science Foundation, was limited, researchers said they hope the platform can soon be extended to humans.

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**LASTING CONNECTIONS IN NEURAL PATHWAYS**

The human brain's billions of neurons connect with each other in precise patterns, and the network between specific groups of neurons (called neural circuits) is responsible for specific behaviors, such as the ability to sense the environment, to move or even assemble memories. With so many neurons, it’s difficult to identify the cues that allow these groups of neurons to form lasting connections, called synapses.

With grants from the Thomas J. Jefferson and Kate Miller-Jeffries Memorial Trust and the NIH National Eye Institute, Michael A. Fox, Ph.D., assistant professor in the Department of Anatomy and Neurobiology, and his research team have been working to create a road map for classes of neurons in the retina, which could provide clues to how other classes of neurons function and how the human brain ultimately works. Specifically, the team identified a cue called reelin, which was necessary for axons from one class of retinal neurons to target the correct region of the brain. According to Fox, there are a number of diseases, such as glaucoma, that affect neurons in the retina and lead to visual impairment or even blindness. In glaucoma, pressure buildup in the eye damages and kills the retinal neurons that connect with corresponding targets in the brain. Mapping these precise neural pathways can then help stem cell researchers differentiate cells injected into damaged tissue.

**THE SMELL OF SUCCESS IN OLFACTORY TRANSPLANTS**

Patients suffering from anosmia, or complete loss of smell, which can stem from olfactory nerve damage caused by head trauma, viral infection, sinus disease, neurological disease, medications or aging, have traditionally had little hope of ever recovering that vital sense. As a result, neurological disease, medications or aging, have traditionally had little hope of ever recovering that vital sense. However, Richard M. Costanzo, Ph.D., professor of physiology and biophysics, and Michael A. Fox, Ph.D., assistant professor in the Department of Anatomy and Neurobiology, and his research team have been working to create a road map for classes of neurons in the retina, which could provide clues to how other classes of neurons function and how the human brain ultimately works. Specifically, the team identified a cue called reelin, which was necessary for axons from one class of retinal neurons to target the correct region of the brain. According to Fox, there are a number of diseases, such as glaucoma, that affect neurons in the retina and lead to visual impairment or even blindness. In glaucoma, pressure buildup in the eye damages and kills the retinal neurons that connect with corresponding targets in the brain. Mapping these precise neural pathways can then help stem cell researchers differentiate cells injected into damaged tissue.

**SUPERIOR GAINS IN SENSORY LOSS**

People who have suffered sensory loss, such as deafness, tend to show compensatory, or even superior, performance in their remaining senses. However, researchers haven’t yet been able to determine how the brain selects its replacement sense.

In a study funded by the NIH, the Jefferson Foundation and the Canadian Institutes of Health Research, VCU researchers, working with a team from Canada, examined the region of the brain in animals that respond to auditory stimuli in order to determine orientation. And, in real animals, they found that the same portion of the brain that responds to visual stimuli was able to control the same orientation features as before, despite the loss of auditory sensory inputs.

Researchers said this insight into how the brain reorganizes itself following sensory loss may improve rehabilitation medicine, such as cochlear implants, in deaf patients.

**A NEW DEFINITION FOR TRAUMA**

Members of the Virginia Treatment Center for Children and social workers in the Department of Psychiatry are leading the way to propose changes to the Diagnostic and Statistical Manual (DSM) of Mental Health Disorders to accurately reflect the needs of children suffering from the effects of trauma.

Currently, the DSM defines trauma as “an incident a person directly experiences that has resulted in serious injury to the person or serious injury or death to someone close to them who was present at the time of the trauma.” However, the clinical definition of trauma is evolving due to recent research findings suggesting that trauma may not be as cut-and-dried as described above.

“Abandonment of a parent may not have been included in the DSM a few years ago, but we are learning that children are responding to those types of events in a way that looks like trauma and that is impacting their development in a traumatic way,” said Leslie Kimball Franck, Ph.D., assistant professor in the Department of Psychiatry.

Additional revisions to the DSM Franck and other seek include abandonment by a parent, chronic neglect or a parent being a chronic substance abuser, as well as exposure to community violence or bullying — all of which broaden the consideration of trauma to include persistent factors.

**SOLUTIONS DELIVERED IN PREGNANCY COMPLICATION**

Recent findings by VCU School of Medicine and international researchers could lead to novel avenues of treatment for pregnant women with pre-eclampsia — one of the most significant complications in pregnancy worldwide and a leading cause of premature delivery and death of the mother and baby.

Researchers were able to isolate an enzyme in expectant mothers’ blood vessels that may be responsible for the high blood pressure, swelling and protein in urine observed in women with pre-eclampsia. This may lead to more clinical studies for potential treatments, such as monoclonal antibodies that could prevent the infiltration of white blood cells, as well as inhibitors that could curb the hyperactive reactivity of blood vessels.

Until these studies are conducted, a separate investigation led by Jerome F. Strauss III, M.D., Ph.D., dean of the VCU School of Medicine, found that food bars containing a semi-essential amino acid and antioxidant vitamins may offer a simple nutritional intervention that could reduce the incidence of pre-eclampsia.

This work was supported by the National Heart, Lung, and Blood Institute, the National Center on Minority Health and Health Disparities, the Entre Kennedy-Sherro National Institute of Child Health and Human Development, Fogarty International, the Bill & Melinda Gates Foundation, the NIH, and the Consejo Nacional de Ciencia Y Tecnología.

**CHILD’S BEHAVIOR DEPENDENT ON MOTHER’S DEPRESSION**

According to a study co-authored by Aradhana Bela Sood, M.D., professor and chair of the Division of Child and Adolescent Psychiatry, effectively treating a mother’s depression helps decrease her child’s behavior problems and symptoms. Previous research has shown that children of depressed mothers are much more prone to developing emotional problems, but it is still not clear whether it’s because of genetics or because of the lack of mother-child interaction.

“The results of the study indicated what we already knew intuitively — that when a woman gets depressed, it can have a far-reaching impact on her children. This work underscores that treatment for a mother’s depression is vital to a child’s recovery,” said Sood, who also serves as medical director of the Virginia Treatment Center for Children.

The women in the study are participants in a larger study funded by the National Institute of Mental Health called the Sequenced Treatment Alternatives to Relieve Depression or STAR*D. VCU is one of 14 regional centers around the U.S. involved in the STAR*D study.

“I think that it is a very exciting thing because now we have a scientific basis to start treating depression in mothers aggressively, actrively and early on, not ignoring what’s going on with children in the household, because we know they’re at great risk,” Sood said.
PUTTING BREAST CANCER ON TRIAL

Two Phase III clinical trials highlight the more than 20 clinical breast cancer trials Massey researchers are in the process of conducting throughout the state of Virginia, each aimed at discovering better treatments and prevention for early, advanced, metastatic and inoperable stages of the disease.

“Whether through new techniques or drugs that work on a molecular level, clinical trials bring new treatments to the fight against cancer,” said Harry Bear, M.D., Ph.D., lead investigator of these trials and chairman of the Division of Surgical Oncology. “The therapies in these clinical trials have been found to be effective in earlier studies and are now being tested head-to-head against current standards of care.”

A preconditioned or pretreated heart has an improved ability to produce nitrates, which can limit the damage following a heart attack related to an inability to recover from lack of oxygen. The work at VCU will involve preclinical evaluation of promising cardioprotective therapies, including preconditioning, sildenafil (Viagra), nitrite and a host of new agents of myocardial infarction.

Rakesh C. Kukreja, Ph.D., principal investigator for the project at VCU, was one of the first to explore the area of preconditioning with doses of Viagra, which also increases therapeutic levels of nitric oxide in the heart.

EXACTED MEASURES IN PROSTATE TREATMENT

Massey researchers have their eyes set on eliminating prostate cancer, the second most common cancer among men, while reducing the damage radiation treatment has on the healthy tissues surrounding the prostate.

An ongoing Phase I clinical trial uses intensity-modulated external beam radiation therapy (IMRT) to shorten treatment times from eight to six weeks while potentially reducing the amount of incidental radiation damage to healthy tissue. IMRT, a fairly recent development, delivers precise doses of radiation more accurately by using computer-controlled linear accelerators. Patients in this trial undergo two planning sessions prior to treatment. First, markers are inserted into the prostate to more accurately position the radiation. Then, a CT scan is performed to determine the proper angle at which the radiation should be applied. This careful planning helps calculate appropriate radiation doses and intensities for each unique tumor.

“Radiation therapy is given using external beam techniques or through radioactive seeds placed directly inside a patient’s tumor or the area of a surgically removed tumor,” said Mitchell S. Ancher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence Mitchell S. Anscher, M.D., lead investigator of the project at VCU.

Another clinical trial at Massey uses the drug lovastatin (also known as Altocor, Altoprev and Mevacor) to help prevent injury to the rectum, as well as the intestines, caused by radiation. Rectal injury is an unfortunate side effect of radiation therapy due to the rectum’s close proximity to the prostate. Laboratory research has shown lovastatin, originally approved by the FDA to treat high cholesterol, also mitigates the effects of radiation on endothelial cells that aid in circulatory function and line the intestines. Patients in this study are assessed to determine which type of radiation therapy will best treat their tumor, and then are given lovastatin for one year during and after their radiation treatments.

CLINICAL TRIALS

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CLINICAL TRIALS
The National Association for Female Executives (NAFE) named the VCU Health System one of its 2011 Top 50 Companies and 10 Nonprofits for Executive Women, which recognizes organizations whose policies and practices encourage women’s advancement and whose numbers at the highest levels of leadership demonstrate that commitment.

This is the fifth time VCU has been named a NAFE top company, and the recognition stems from the VCU Health System’s commitment to the advancement of women through training and educational programs that result in leadership roles through efforts like its education assistance program for employees and dependents, online GED prep courses and professional development workshops.

“NAFE applauds the VCU Health System for once again making the list of the NAFE Top Nonprofits,” said Betty Spence, Ph.D., NAFE president. “They offer an environment where women have exceptional opportunities to succeed.”

To be considered for the NAFE Top Companies for Executive Women, companies must have a minimum of two women on their board of directors as well as at least 500 employees in the U.S.
A decade of physical growth, in new and expanded VCU Medical Center facilities, represents our commitment to quality education and patient care.

**2000**
MASSEY CANCER CENTER AT STONY POINT
- $6.6 million
- 20,000-square-foot addition
- On-site, state-of-the-art, 3-D radiation treatment planning simulator
- Seven chemotherapy treatment rooms, 10 exam rooms

**2002**
GATEWAY BUILDING
- $10 million
- Nine levels, 215,100 square feet
- MCV Hospitals’ new front door, connecting Main Hospital to Nelson Clinic and creating a central entrance for both patients and families

**2006**
GOODWIN RESEARCH LABORATORY
- $41.5 million
- 80,000 square feet
- 68 lab modules
- Open architecture layout with space for up to 250 researchers
- Healing garden provides restorative space for patients and families

**2007**
SCHOOL OF NURSING BUILDING
- $111 million
- 110,000 square feet
- First building at VCU constructed solely for the purpose of educating future nurses
- Clinical learning center with high-tech patient simulators
- Three stories, research laboratories and a community outreach nursing center

**2008**
CRITICAL CARE HOSPITAL
- $184 million
- 15 levels, 367,000 square feet, 232 adult patient beds
- Virginia’s only hospital devoted solely to critical care
- Surgical suite with 10 large high-tech operating rooms
- State-of-the-art neonatal intensive care unit that accommodates over-night stays by parents
- Home of the Evans-Haynes Burn Center, the region’s only resource for the care of adult burn and reconstructive needs of burn survivors

**2009**
W. BAXTER PERKINSON, JR. BUILDING
- $20 million
- 55,000-square-foot, four-story addition to School of Dentistry
- Enabled school to increase enrollment in dentistry and dental hygiene
- LEED Silver certified
- Features light-colored roofing for 30 percent energy savings, low flow plumbing and low volatile organic compounds to improve indoor air quality

**2009**
MOLECULAR MEDICINE RESEARCH BUILDING
- $71.5 million
- Eight stories, 125,000 square feet
- Houses 48 principal investigators and their staffs
- Laboratory floors designed with open layout encourage interaction among researchers
- Connects floor by floor to the adjacent Hermes A. Kontos Medical Sciences Building
- Awarded Project of the Year in the public and private sectors by Richmond Real Estate Group
- LEED Silver certified

**2010**
ROBERT BLACKWELL SMITH BUILDING
- $5 million
- Renovation
- First, second and fifth floors designated LEED Silver project
- Features wide open student commons, three labs with state-of-the-art technology, expanded patient interaction areas and conference rooms

Coming spring 2013
JAMES W. AND FRANCES G. MCGLOTHLIN MEDICAL EDUCATION CENTER
- $158.6 million
- 12 stories, 200,000 square feet
- Includes larger classrooms, enabling school to increase the total medical student body to 1,000
- Will serve as home to the Center for Human Simulation and Patient Safety with top floors housing Massey Cancer Center’s research pavilions
- Designed for LEED Silver certification
### VCU HEALTH SYSTEM FINANCIAL STATEMENT*

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total operating revenue</td>
<td>$1,728,733</td>
</tr>
<tr>
<td>Salaries, wages and benefits</td>
<td>$695,897</td>
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<tr>
<td>Total operating expenses</td>
<td>$1,583,562</td>
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<tr>
<td>Supplies</td>
<td>$229,259</td>
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<tr>
<td>Net operating income/(loss)</td>
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<tr>
<td>Purchased services and other expenses</td>
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<td>Nonoperating revenues and expenses</td>
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<tr>
<td>Depreciation and amortization</td>
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<tr>
<td>Medical claims expense</td>
<td>$438,782</td>
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*Includes VCU Health System components: MCV Hospitals, MCV Physicians, Virginia Premier Health Plan, Carolina Crescent Health Plan, Children’s Hospital of Richmond at VCU, University Health Services (UHS) and UHS Professional Education Programs (UHS PEP).

### VCU HEALTH SYSTEM AUTHORITY BOARD OF DIRECTORS

- Dr. Michael Rao, President and Chair
- Mr. Robert M. Blue
- Ms. Katherine E. Busser
- Ms. Lakshmi Challa
- Dr. Ponijola Conely
- Delegate M. Kirkland Cox
- Dr. George W. Vetrovec

### VCU BOARD OF VISITORS

- Mr. Thomas G. Strad Jr., Rector
- Dr. Kamlesh N. Dave
- Mr. Brian K. Jackson, Secretary
- Dr. J. Alfred Broaddus Jr.
- The Honorable Kay Colfax James
- The Honorable Alexander B. McMorris Jr.

### RAISED RATINGS

- **S&P rating:** AA-
  - Outlook: Stable
- **Moody's rating:** A1
  - Outlook: Positive

National rating agencies Standard & Poor’s and Moody’s raised their ratings of the VCU Health System in 2011, citing the organization’s solid business position as the only academic medical center in Central Virginia. They also noted a strong trend of stable operating performance over the past several years, a wide regional draw with exclusive high-end acute care clinical services in the Richmond area, a strong management team, a significant campus investment with the more recent completion of the Critical Care Hospital and, counter to national trends, solid inpatient, outpatient and surgical volume growth in recent years.

### VCU HEALTH SYSTEM OPERATING REVENUE

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Operating Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>$598,410</td>
</tr>
<tr>
<td>2004</td>
<td>$678,897</td>
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<tr>
<td>2005</td>
<td>$726,106</td>
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<tr>
<td>2006</td>
<td>$857,123</td>
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<tr>
<td>2007</td>
<td>$1,032,800</td>
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<td>$1,112,227</td>
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<tr>
<td>2009</td>
<td>$1,230,558</td>
</tr>
<tr>
<td>2010</td>
<td>$1,378,221</td>
</tr>
<tr>
<td>2011</td>
<td>$1,581,622</td>
</tr>
<tr>
<td>2012</td>
<td>$1,745,067</td>
</tr>
</tbody>
</table>

Total operating revenue has nearly tripled since the creation of the VCU Health System.

### VCU HEALTH SYSTEM NET INCOME

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Income/(Loss)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>$27</td>
</tr>
<tr>
<td>2004</td>
<td>$197</td>
</tr>
<tr>
<td>2005</td>
<td>$36</td>
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<tr>
<td>2009</td>
<td>$45</td>
</tr>
<tr>
<td>2010</td>
<td>$63</td>
</tr>
<tr>
<td>2011</td>
<td>$159,621</td>
</tr>
</tbody>
</table>

The health system’s margins provide the resources to invest in capital infrastructures and clinical programs, and support the academic mission.