



**DECADE** of  
**DIFFERENCE**

the 2011 annual report

**VCU** Medical Center  
Every Day, A New Discovery.®

V i r g i n i a   C o m m o n w e a l t h   U n i v e r s i t y



# 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 to not only 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.

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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-acute 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 recognition 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](http://www.vcuhealth.org/annualreport).

Sincerely,

Michael Rao, Ph.D.  
President  
VCU and VCU Health System

Sheldon M. Retchin, M.D., M.S.P.H.  
CEO, VCU Health System  
Vice President, VCU Health Sciences

# DECADE <sup>of</sup> PATIENT CARE

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.

## 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, urinary systems and extremities, which led David Lanning, M.D., Ph.D., associate professor in the Department of Surgery and CHoR'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.

## 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.

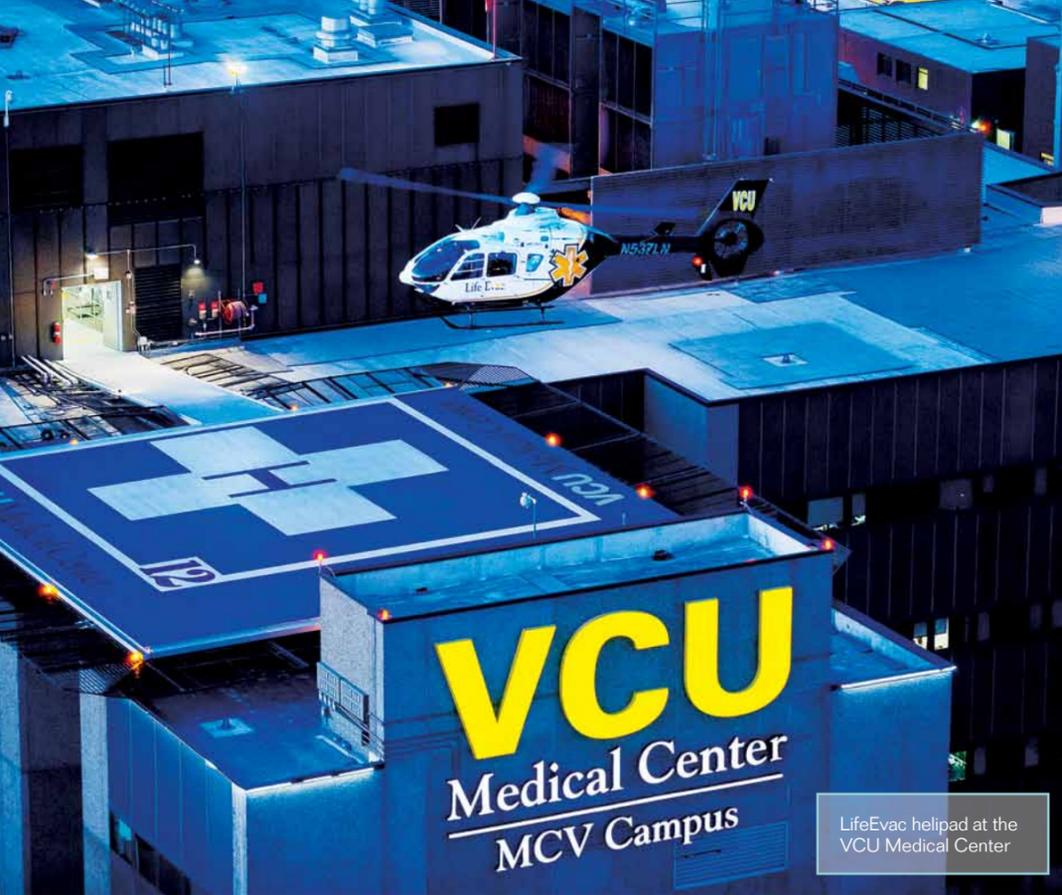
## A success that couldn't wait

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](http://www.vcuhealth.org/annualreport).**



LifeEvac helipad at the VCU Medical Center



## FIVE-TIME WINNER OF BEACON AWARD

The American Association of Critical Care Nurses presented the Progressive Care Medicine Unit with a Beacon Award for Excellence, making it the fifth VCU Medical Center unit to earn the distinction, along with Surgery Trauma ICU, Medical Respiratory ICU, Neuroscience ICU and the Pediatric ICU. The Beacon Award honors those units that demonstrate strong patient outcomes and exemplify outstanding service and innovation.

## SHINING ON WITH 5-DIAMOND AWARD

The Mid-Atlantic Renal Coalition awarded the 5-Diamond Patient Safety Award to the VCU Medical Center's Dialysis Unit. The program seeks to improve both staff and patient awareness of specific patient safety areas and consists of education modules including patient safety principles, emergency preparedness and hand hygiene. For each module successfully completed, the facility receives a "diamond," culminating in special recognition for the 5-Diamond facilities.

# RANKED AMONG THE BEST OF THE BEST

The VCU Medical Center kicked off 2011 with a Richmond metro area No. 1 designation in *U.S. News & World Report's* 2011-12 Best Hospitals rankings, and the nod set the tone for another strong showing in the publication's annual national specialty distinctions, as the Department of Nephrology earned a spot in the top 50 in the country.

In each of the prior two years, the Department of Physical Medicine and Rehabilitation received top 20 billing, and since 2007, the medical center has garnered top 50 standings in heart and heart surgery, kidney disease, orthopaedics, and cancer treatment.

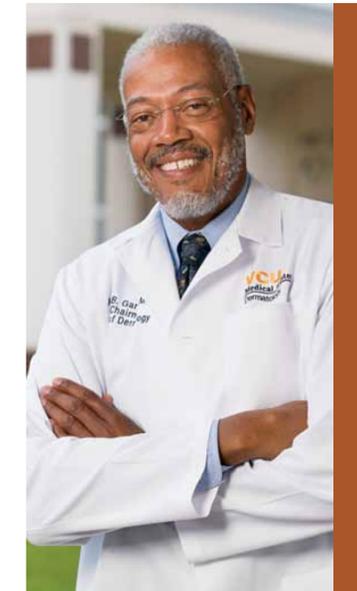
With seven Consumer Choice Awards over the past decade, as well as numerous other distinctions from such diverse organizations as The Joint Commission, Thomson Reuters and *Working Mother* magazine, the

medical center has cemented its status as Virginia's top provider of quality health care and workplace excellence.

Of course, national accolades depend on top-notch providers, and the 2011 Top Docs survey printed in April's *Richmond Magazine* has shown medical center physicians to be at the top of their game. The survey asked local physicians whom they would recommend in a range of specialties from 53 categories and listed 110 full-time medical center physicians, with seven appearing in more than one category. In addition, three standouts were recognized individually as "local medical heroes" by the magazine: Christopher Kogut, M.D., assistant professor in the Department of Psychiatry, was lauded for his volunteer work at the Fan Free Clinic in Richmond; Richard Hubbard, a second-year



Several of VCU Medical Center's top doctors  
*Left:* Cecelia H. Boardman, M.D., Department of Obstetrics and Gynecology  
*Bottom left:* Robin L. Foster, M.D., Department of Emergency Medicine  
*Bottom right:* Algin B. Garrett, M.D., Department of Dermatology



medical student in the School of Medicine, earned the honor for his dedication to helping the impoverished in Bangladesh; and Barton Bobb, F.N.P., A.C.H.P.N., of the Massey Cancer Center, was named this year's top nurse practitioner.

# 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.

# A NIGHT TO HONOR ALL-FOR-ONE HEROES IN RICHMOND

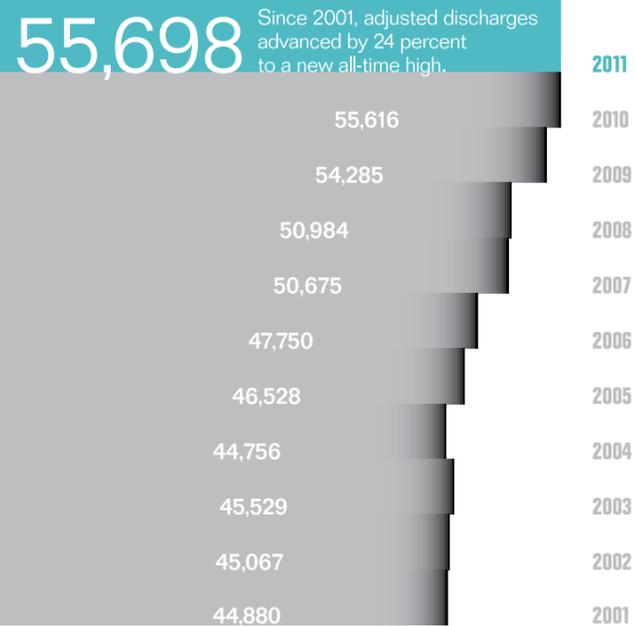
The Division of Trauma, Critical Care and Emergency Surgery presented its third annual Shining Knight Gala March 26, 2011, to raise funds for the Injury and Violence Prevention Program and to honor those who protect and save lives in Central Virginia.

One of the event's highlights included a multimedia presentation that recounted Chris Baker's story of survival after being shot and the extraordinary efforts made by the team of professionals who saved the teen's life. For their contribution to Baker's survival, 23 Richmond area first-responders and medical center caregivers were given the Order of the Shining Knight.

In 2011, 3,683 patients were admitted into the trauma center for a variety of reasons, including vehicle crashes, falls, burns and crime-related injuries. The VCU Medical Center is one of only two nationally recognized Level I trauma centers in the state and is the only one in Central Virginia.

VCU Health System volume

## ADJUSTED DISCHARGES



# 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 a reduction of error in dose delivery.

In addition, because VMAT more efficiently uses the radiation beam, secondary radiation is substantially diminished in comparison to conventional techniques. According to Mitchell Anscher, M.D., professor and Florence and Hyman Meyers Chair of Radiation Oncology at Massey, "VMAT significantly lessens the patient's whole body radiation exposure, thereby decreasing the risk of radiation-induced secondary cancers."

# HIGH-DEFINITION CT SCANS IN A FLASH

The VCU Medical Center's Department of Radiology acquired the first dual-source, second-generation CT scanner in Virginia, providing cutting-edge imaging to assist health care providers with diagnosis and treatment of multiple medical conditions.

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."



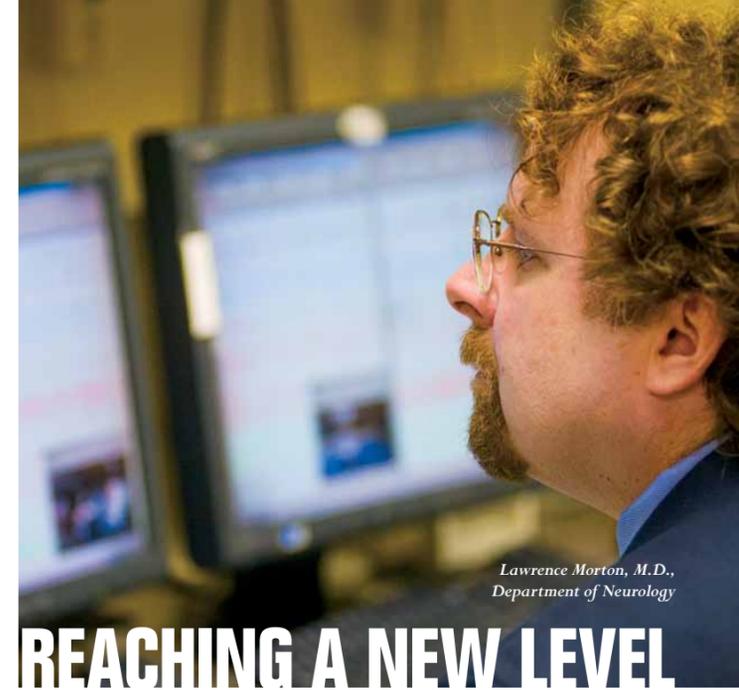
SOMATOM CT scanner

## PANAMERICAN TRAUMA SOCIETY AT HOME WITH VCU

The Panamerican Trauma Society — the lead organization for the advancement of trauma care systems in the Americas — has found a new home at the VCU Medical Center. Hosted by the Department of Surgery's Division of Trauma, Critical Care and Emergency Surgery, which marked its 30th year as a Level I trauma center in November, the society will continue to seek to improve trauma systems through educating health care personnel and emphasizing injury and violence prevention.

Rao Ivatury, M.D., FACS, FCCM, the B.W. Haynes, Jr., MD Professor in General and Trauma Surgery and chair of the Division of Trauma, Critical Care and Emergency Surgery, and Michel B. Aboutanos, M.D., M.P.H., FACS, associate professor of surgery, serve as executive director and secretary general of the society, respectively, spearheading educational conferences, training courses, peer-reviewed publications and advocacy efforts at the local and national levels.

Along with the transition of the headquarters, the *Panamerican Journal of Trauma* also will be under the leadership of Ivatury, who was voted editor-in-chief of the publication.



Lawrence Morton, M.D., Department of Neurology

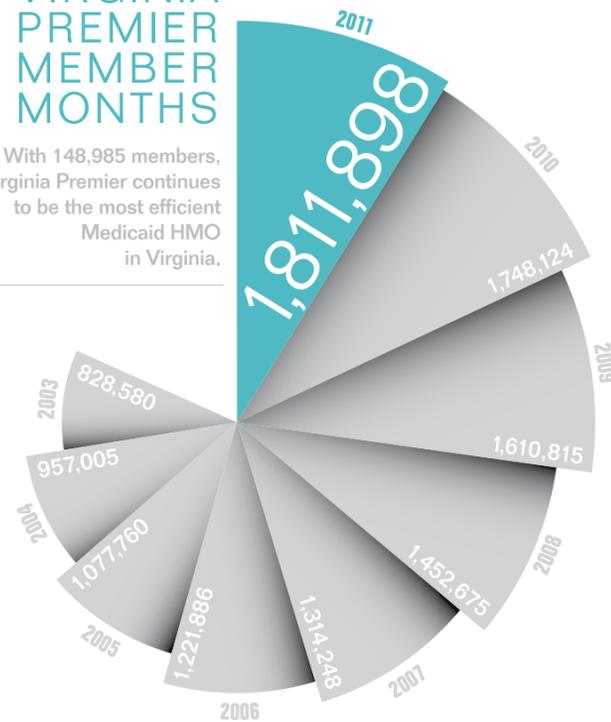
## REACHING A NEW LEVEL OF EPILEPSY CARE IN CENTRAL VA

The National Association of Epilepsy Centers (NAEC) designated the Department of Neurology's Epilepsy Monitoring Unit as a Level 4 Epilepsy Center, making it the only one of its kind in Central Virginia. According to the NAEC guidelines, a fourth-level center provides the more complex forms of intensive neurodiagnostics monitoring, as well as more extensive medical, neuropsychological and psychosocial treatment. These centers also offer a complete evaluation for epilepsy and provide a broad range of surgical procedures for the condition.

VCU Health System volume

### VIRGINIA PREMIER MEMBER MONTHS

With 148,985 members, Virginia Premier continues to be the most efficient Medicaid HMO in Virginia.



## GREATER CARE FOR THE REGION'S SMALLEST PATIENTS

Plans for a new pediatric pavilion capped a busy 2011 for the Children's Hospital of Richmond at VCU and will make the hospital the largest, most advanced outpatient facility dedicated to children in the region. Slated 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 Service, which provides continuity of care to patients, aged 12 to 22, with acute and chronic medical problems, behavioral concerns, musculoskeletal issues, skin problems and others conditions, as well as the designation of a new comprehensive traumatic brain injury clinic at CHoR's Brook Road campus. The CHoR TBI clinic serves children who have been seen in the hospital, ER or physician's office for a brain injury and helps guide children and families through the recovery process — from the management of neurological symptoms to addressing school and social issues.

## NURSING A COMMUNITY INTO HEALTHIER DAYS

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 Tenant Council 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,

which provided funding for the center, services also include AIDS testing, family planning, teen peer support, tutoring assistance, budget management and community resource information.

"There are a lot of people out there who don't have the means to get to the doctor and don't have proper health care," said Aquanetta Scott, vice president of the Mosby Tenant Council. "The new clinic [is a] great addition for everybody in the neighborhood as well as the surrounding areas."

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.



Nancy Langston, Ph.D., R.N., FAAN, School of Nursing, with Richmond residents at the Mosby Resource Center

"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

The Virginia Treatment Center for Children (VTCC) partnered with several organizations in the Richmond area to create the Children's Mental Health Resource Center (CMHRC), a community program that allows children and families to better access and navigate the mental health service system.

In Virginia, fewer than 300 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 miscommunication 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 for help," 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, mentoring and ongoing opportunities for family members to learn more about conditions, diagnoses and treatments.

The most comprehensive childhood mental health resource center in the state, CMHRC receives funding support through the Jenkins Foundation, the Jackson Foundation, the VTCC Advisory Council and private donors.

## THE HEART OF A LEGACY IN A NEW VASCULAR INSTITUTE

The name of one of the nation's pioneering cardiologists, Charles L. Baird Jr., M.D., lives on through 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 vertebral 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.



Interns with a standardized patient in the School of Nursing's simulation lab

## 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 Shawna 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 as health care providers, but also as members of a team of health care professionals.

"Incorporating this curriculum into intern orientation is a meaningful step forward on our journey to become America's safest health system," O'Donnell said.



Malcolm Sydnor, M.D., Baird Vascular Institute, and Jane B. Baird Hyde

## 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 men's basketball head coach Shaka Smart visited patients and staff at the burn center, bringing along sophomore Rob Brandenburg and freshmen Treveon Graham and Briante 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," Brandenburg 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."



Basketball head coach Shaka Smart (right) with patients at the VCU Evans-Haynes Burn Center

VCU Health System volume

### TOTAL SURGERIES



## 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, cardiothoracic 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 spurred 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 screens had a reduced risk of dying from lung cancer when compared with those who received standard annual chest X-rays alone.

## 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 diseases and movement disorders. A major goal of the center is to advance the understanding of Parkinson's and related conditions in terms of defining biological causes and developing new treatments.

We're building the pinnacle of health care education even higher. Thanks to a rich history and generous support system, we inspire and pave the way for future health care professionals through our expanding base of world-class faculty, cutting-edge facilities and groundbreaking technology.

## 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. The 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](http://www.vcuhealth.org/annualreport).



(From left) Michael Rao, Ph.D., VCU and VCU Health System president; James McGlothlin; Sheldon Retchin, M.D., M.S.P.H., VCU Health System and VCU Health Sciences; Frances McGlothlin; Harold F. Young, M.D., Department of Neurosurgery; and Jerome F. Strauss III, M.D., Ph.D., School of Medicine, at the "topping out" ceremony for the new medical education building

## TOMORROW'S MEDICAL TRAINING: FROM THE GROUND UP

VCU officials and Virginia Gov. Bob McDonnell announced in April 2011 a \$25 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 construction 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, 200,000-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 avertable deaths, and while the new County Health Calculator adds income as a determining 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 (a sister project by the University of Wisconsin Population Health Institute that provides a snapshot of community health for more than 3,000 counties in the U.S.) Fairfax County ranked No. 1 in Virginia. By using the County Health Calculator, however, VCU researchers were able to determine that if Richmond had the same income level as Fairfax County, 17 percent of deaths would be averted.

## THE FUTURE OF PHARMACY

The VCU School of Pharmacy brought together pharmacy experts from across North America at its Pharmacy Practice in the Commonwealth of Virginia: The Practice Transformation Conference in June. The daylong conference provided 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 pharmacy practice models in various Virginia health care settings.



Sandra Voll, M.S., R.N., CNM, WHNP, FNP (left), and Lisa Sievers (right), School of Nursing, with a patient

## 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 collaborating 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 population. 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 chapter 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 prevention, the students provided lectures and screenings on diabetes, filled out health passports for villagers and helped educate people about the importance of hydration in children as well as how to spot early warning signs of dehydration. In one village, teams split off into pairs and helped

five families build stoves for their households due to the large number of upper-respiratory problems associated with cooking over open fires.

"I don't think I will ever meet a more amazing group of women than those that joined me on this trip,

those that made this trip possible and those I met in Guatemala working hard to empower their communities," said VCU's NSWB President Danielle Viggiani. "It was an unforgettable experience, one I plan to have NSWB be a part of again next year."



Meredith Black with a young patient in Guatemala

## COLLABORATIVE EDUCATION FOR GERIATRIC CARE

A grant totaling more than \$1 million from the Donald W. Reynolds Foundation will support a new interdisciplinary program to enhance geriatrics training for medical students in the schools of Allied Health Professions, Medicine, Nursing, Pharmacy and Social Work.

Along with training in competencies related to the care of older patients, the grant will help foster interprofessional education by tasking groups of students from each of the five schools to work together in teams to solve a complex, evolving virtual elderly patient case. In addition, students will gain in-person learning experiences with older persons with chronic health conditions in community living settings.

Once developed, the program will then be made available to other institutions to use.

## OUT WITH THE OLD MEDS

The VCU School of Pharmacy's Phi Delta Chi professional fraternity, in conjunction with the VCU Police Department, used 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 poisoning, but can also help the environment. In 2010, Americans turned in a total of more than 121 tons of pills during the first National 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.

## LEADING THE PACK IN HEALTH SCIENCES

VCU capped the decade with a bevy of top national endorsements, highlighted by the School of Allied Health Profession's Nurse Anesthesia program's No. 1 billing in the *U.S. News & World Report* 2011 rankings. Additionally, the school's health services administration and rehabilitation counseling programs earned top-10 spots, while the occupational therapy and physical therapy programs garnered top 15 and top 25 distinctions, respectively, during the latest ranking cycle for those disciplines in 2012.

Between the 2008 and 2011 rankings, the schools of Nursing and Pharmacy each earned 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.

# CORNERSTONE OF COLLABORATION

How can VCU train future providers to integrate into, as well as lead, a health care system that promises to be more team-based and interactive? Thanks to a two-year, \$200,000 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.

"We 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.



Alan Dow, M.D. (right), Department of Internal Medicine, in a training session with a medical student

# DUO OUT TO DEFEAT DIABETES

School of Pharmacy teams, working with the organizations CrossOver Health Care Ministry and The Daily Planet, were awarded two of only 25 health care grants issued nationwide by the American Pharmacists Association Foundation's Project IMPACT: Diabetes, IMProving America's Communities Together, a three-year initiative designed to help pharmacists integrate into health care teams so as to address the challenges faced by patients with diabetes.

Sallie Mayer, Pharm.D., M.B.A., BCPS, assistant professor at the School of Pharmacy, has been named community champion for the CrossOver project, which also will partner with Richmond's Fan Free Clinic and the Goochland Free Clinic to provide a wide variety of health care services. Patients at one of CrossOver's three free clinics will work with a core diabetes care team focused on areas such as nutrition, ophthalmology, podiatry and counseling.

Jean-Venable "Kelly" Goode, Pharm.D., BCPS, FAPhA, FCCP, professor and director of the Community Pharmacy Practice and Residency Program, will serve as community champion for The Daily Planet project, a federally qualified health care for the homeless clinic, which offers comprehensive interdisciplinary diabetes outreach to provide diabetes risk and prevention education, screening and diabetes management.

# RESEARCH BOOST FOR FAMILY DOCTORS

The School of Medicine'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 \$336 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.



2011-12 Humphrey Fellows (back row, from left) Laith R. Khalil, M.B.Ch.B., Lionel Kulathilake, Pansak Pramokchon, Pedro Augusto de Andrade Rodrigues, (front row, from left) Natalia Estoyanoff, Rogers Kasirye, Aizhan Zhumasheva, M.D., Tin Moe Aung, M.B., B.S.

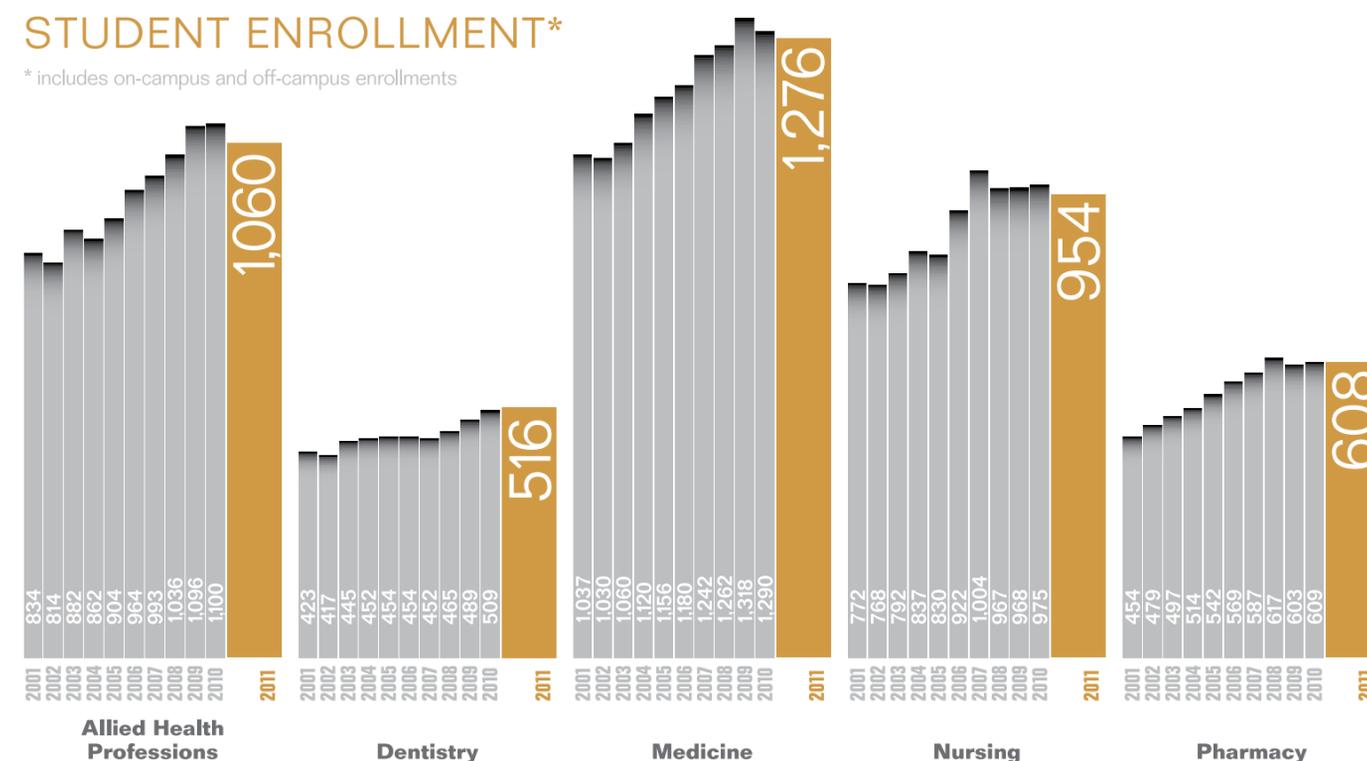
# TAKING AIM AT SUBSTANCE ABUSE

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.

While VCU's program focuses on substance abuse prevention and treatment, it also provides training in the broader public health field. Humphrey Fellows enhance their professional knowledge and leadership abilities not only by drawing on the expertise of university faculty, but also through affiliations with community-based and state agencies, which provide real-world exposure to research, treatment, prevention and policy in a midsized American city.

## STUDENT ENROLLMENT\*

\* includes on-campus and off-campus enrollments



## SCHOOL OF PHARMACY REACCREDITED

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 30 accreditation standards and were given a full six-year accreditation," said School of Pharmacy Dean Victor Yanchick, Ph.D., the Archie Owens McCalley 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.



Medical student Alicia Bell (center)

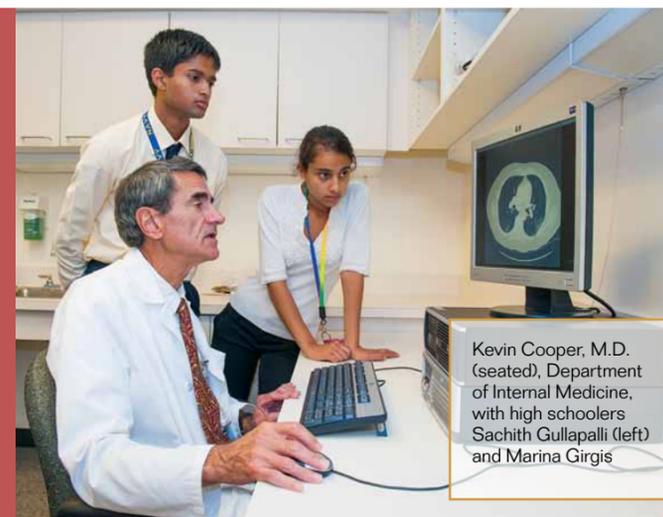
## ANSWERING THE BELL

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.

As the 2011-12 medical professionalism education coordinator, Bell will help develop and distribute educational content related to standards of professionalism in the medical education setting to AMSA's members throughout the year.

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 Medical Association, the Student National Medical Association and the VCU chapter of the Medical-Legal Partnership at the Children's Hospital of Richmond at VCU, which serves low-income children and their families.

## FROM HIGH SCHOOL STUDENT TO HOSPITAL DOCTOR



Kevin Cooper, M.D. (seated), Department of Internal Medicine, with high schoolers Sachith Gullapalli (left) and Marina Girgis

VCU's drive to teach the next generation of medical professionals extends beyond its own residents and interns. 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.

## A SIMULATED FAMILY CIRCLE

The School of Nursing's Clinical Learning Center (CLC) welcomed in September one of the newest pediatric simulators 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, talks, 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 geriatric 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 to students so they can think critically and adjust their care plans accordingly.



Medical students in a patient simulation exercise

## 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

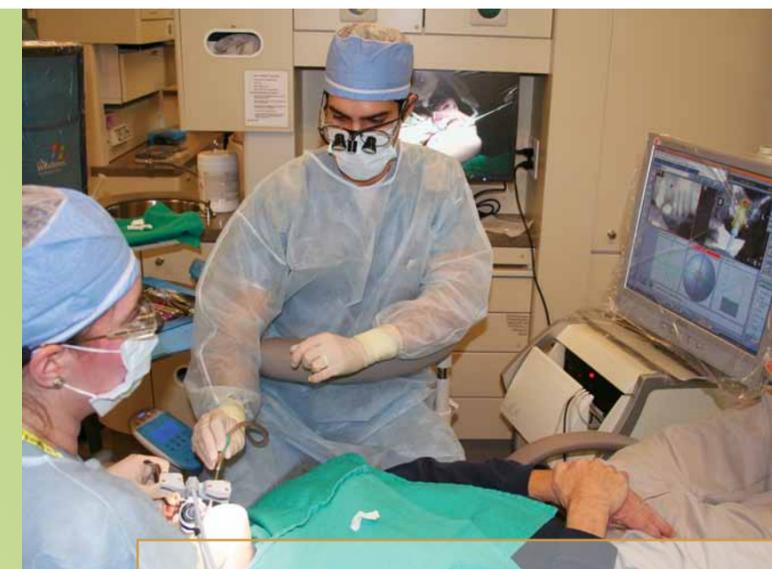
according to the needs of different departments and specialties, and the program may also be used to develop ways to assess the interpersonal communication skills of students. Similarly, officials hope to increase the pool of standardized patients to 100 to 150 and establish a bank of common cases. They also plan to disseminate these tools for other institutions to use in their training.

## 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.



Sayward Duggan, D.D.S., M.S.D. (left), and Rafael Rodriguez, D.D.S., M.S.D., placing an implant with the help of IGI technology

Our laboratories serve as the birthplace for life-saving innovations. As one of the nation's leading research institutions, we accelerate the development of new and promising discoveries. The work of our nationally renowned physician-scientists translates to healthier communities and a better quality of life for patients worldwide.

## 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."

## 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.

**For more on these stories,**  
visit [www.vcuhealth.org/annualreport](http://www.vcuhealth.org/annualreport).



## IN GOOD COMPANY WITH ELEVATED RESEARCH STATUS

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 academic medical centers to achieve both Carnegie Foundation distinctions.

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 \$256 million in sponsored research — an effort punctuated in July 2010 by a \$20 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.

## CLEAN AND COMFORTABLE MEASURES IN THE ICU

School of Nursing researchers have found that adding the use of chlorhexidine (an antibacterial agent) to the oral care regimens of intubated patients significantly decreases those patients' risk of developing ventilator associated pneumonia (VAP).

According to the research team, led by Mary Jo Grap, Ph.D., R.N., ACNP, FAAN, Nursing Alumni Endowed Professor, up to 25 percent of patients who are mechanically intubated in intensive care units develop VAP, which can increase morbidity and mortality, as well as health care costs. Brushing alone does little to decrease a patient's risk of contracting pneumonia; however, the

administration of chlorhexidine lowers that risk considerably, researchers said. Researchers also were able to determine that the most effective way to administer chlorhexidine was with a swab. The use of chlorhexidine is now part of the nationally recognized standards of care for the prevention of VAP.

Grap also was part of a team of VCU inventors issued a U.S. patent for a new device intended to reduce pneumonia in mechanically ventilated, critically ill patients. It will be part of an endotracheal tube (breathing tube) that will either absorb oral secretions, preventing them from moving around the tube

and into the lungs potentially causing pneumonia, or it will be a device that would contain antibacterial properties so that any secretions that may reach the lungs do not contain pneumonia-causing bacteria.

Still, because intubated patients need to be elevated to reduce the risk of pneumonia, that position can put a lot of pressure on a patient's backside, potentially causing painful pressure ulcers. To combat this related complication, researchers are currently generating data to determine the link between backrest and the development of skin ulcers in ICU patients. By using a pad to measure how much pressure is exerted by the body in this position, researchers can then make determinations regarding the degree to which that pressure is a contributing factor to skin ulcer development.

## THE HIGH PRICE OF FOOD ALLERGIES

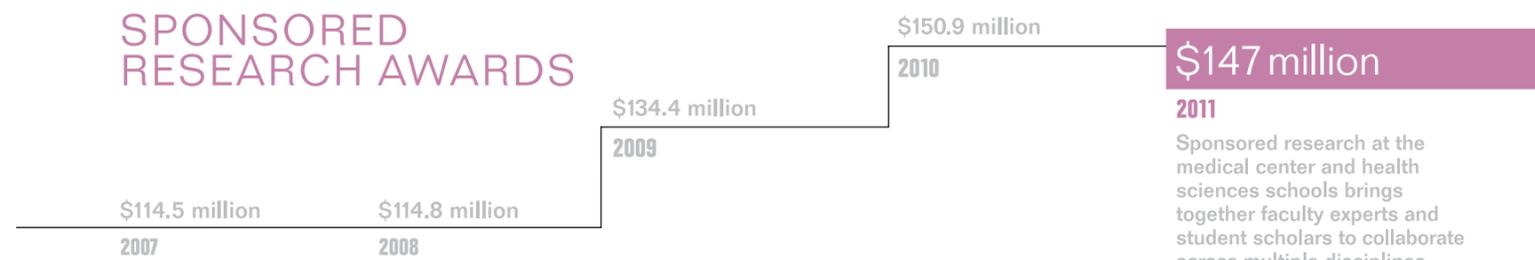
According to School of Pharmacy researchers, food allergy reactions in the U.S. each year cause approximately 5,600 inpatient admissions, 82,000 emergency room visits, 33,000 outpatient clinic visits and 585,000 office-based physician visits — the cost of which, coupled with lost productivity as a result of food allergy reactions, registers between \$340 million and \$510 million.

Researchers used federal databases to formulate their numbers and suggest that the cost related to food allergy reactions in the U.S. may in fact be higher due to the difficult-to-quantify costs associated with food allergies, such as purchases of epinephrine devices that are never used, out-of-pocket costs to patients (including insurance copayments and transportation to health providers) and purchases of special diets and allergen-free foods.

While \$510 million is less than the cost of treatment for other chronic conditions such as asthma, researchers found that the cost per individual patient was higher. For example, the average cost per food allergy emergency room visit was \$533 compared with \$345 for asthma.

This study is the first to quantify the costs associated with food allergies and should be able to guide future research into the impact of food allergies, as well as inform decisions on public health policy and clinical guidelines.

## SPONSORED RESEARCH AWARDS



**2011**  
Sponsored research at the medical center and health sciences schools brings together faculty experts and student scholars to collaborate across multiple disciplines.

## A CLEAR PATH FOR IMPROVED KIDNEY FUNCTION

Research into the ways molecules 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 recognized 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.

## BREATHING THE BENEFITS OF AEROSOL MEDICATION

Partnering researchers in the schools of Engineering and Pharmacy earned three separate grants from the National Heart, Lung, and Blood Institute aimed at improving the delivery of aerosolized medicines to increase drug effectiveness and reduce unwanted side effects.

Researchers were awarded \$1.8 million to develop novel technology for the efficient delivery of pharmaceutical aerosols during noninvasive ventilation (NIV) that minimizes drug loss in the NIV system and nasal airways in order to maximize drug delivery to the lungs.

A similar project to develop a novel technology for the efficient delivery of inhaled nanoaerosols that minimizes drug loss in the mouth and throat while maximizing delivery in the lungs through the inclusion of safe, water-absorbing compounds earned a \$408,155 grant, which could help unlock the potential use of the lungs to deliver vaccines and gene therapy.

Finally, researchers also earned \$396,636 to develop technology for inhalable medications for the treatment of respiratory diseases (such as lung cancer, respiratory infections and cystic fibrosis) and systemic conditions (such as diabetes, chronic pain and growth deficiency). As with the previous project, the goal is to maximize drug delivery to the lungs while reducing loss in the mouth and throat.

# 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, Masoud Manjili, 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 in 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 Manjili, 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 I/II clinical trial.

## A GIFT FROM THE PAST TO SUPPORT FUTURE THERAPIES

Michael Rao, Ph.D., president, VCU and VCU Health System



VCU announced in August its largest-ever cash gift of \$45 million, part of a multifaceted trust created by Arthur Graham and Margaret Branch Glasgow before their death that also bequeaths money to the Virginia Museum of Fine Arts and 13 other Richmond, Va., charities.

VCU's portion of the trust will be used to support the prevention and cure of cancer and other degenerative diseases, and Michael Rao, Ph.D., president of VCU and the VCU Health System, called it "the kind of gift that helps elevate a university even further."

"As 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.

## CALL FOR CHANGE IN ONCOLOGY

Spearheading effective dialogues surrounding national health care issues can be just as vital to the scientific community as what's accomplished in the lab. To illustrate, researchers, including Bruce E. Hillner, M.D., professor and eminent scholar in the Department of Internal Medicine, presented 10 changes they feel medical oncologists need to make to maintain or improve care and save money for future medical advances.

Published in *The New England Journal of Medicine*, the authors suggest changes in the behaviors and attitudes of medical oncologists that could save the nation billions of dollars in the face of the \$173 billion the U.S. is projected to spend annually on cancer care by the year 2020.

The team called for more frank discussions about end-of-life care between physicians and patients and increased scrutiny regarding expensive treatments and surveillance tests, among many other recommendations, which could cut back on the continuation of treatments in situations where those treatments are no longer beneficial for the patient.

"We recognize that these [recommendations] raise tough questions," Hillner said. "But now is the time to talk about how we can preserve money to ensure all patients receive the best available care while setting aside funds for new and advanced therapies. We have outlined the starting points for discussion and hope a much-needed national dialogue will follow."

## TREATING THE SYMPTOMS OF TREATMENT

School of Nursing researchers have put to use NIH funding totaling more than \$1.5 million to support the early detection and management of breast cancer treatment symptoms through two ongoing projects led by principal investigator Debra Lyon, Ph.D., R.N., FNP-BC, FNAP, FAAN, the Judith B. Collins and Joseph M. Teehey Distinguished Professor and chair of the Department of Family and Community Health Nursing.

By examining the role that changes in gene function play in the development of frequently reported psychoneurological 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 those symptoms remains critical, and researchers are exploring cranial electric stimulation (CES) as a complementary form of therapy for breast cancer symptom management. CES is a noninvasive, portable and easily standardized treatment that uses microcurrent-pulsed high frequency carrier waves to re-establish optimal neurotransmitter levels and functioning in the brain.

Previous studies have demonstrated that CES therapy can lower symptoms of depression and sleep disturbances, and researchers seek to evaluate its effects on those symptoms, as well as anxiety, fatigue and pain in women receiving adjuvant chemotherapy. Additionally, researchers are using this study to explore the biobehavioral mechanisms underlying the

development of those symptoms and determining their effect on quality of life.

By understanding those mechanisms, researchers said they can explore the causes of psychoneurological symptoms and identify patients who are at a high risk of developing them prior to treatment.



Debra Lyon, Ph.D., R.N., FNP-BC, FNAP, FAAN, Department of Family and Community Health Nursing



## DRUG COMBO RESULTING IN PLEASANT SIDE EFFECTS

Massey researchers completed a Phase I clinical trial evaluating the use of the drugs bortezomib and alvocidib in patients with relapsed or refractory blood cancers, marking the first time a proteasome inhibitor (such as bortezomib) was combined with a cell cycle inhibitor (such as alvocidib) to treat patients with cancer, according to co-investigator Steven Grant, M.D., the Shirley Carter Olsson and Sture Gordon Olsson Endowed Chair in Oncology, professor of internal medicine and co-chair of Massey's Developmental Therapeutics program.

Supported by funding from a V Foundation Translational Research Award and the NIH, the trial included 16 patients who had either indolent (nonaggressive) non-Hodgkin's lymphoma, mantle cell lymphoma or multiple myeloma. After they received a 21-day cycle of treatments, two participants experienced complete responses, meaning that all detectable traces of the cancer were gone, and five had partial responses.

While the trial was meant only to determine the maximum tolerated dose with acceptable side effects for this novel drug combination, the above-mentioned therapeutic responses in 44 percent of patients was encouraging, said Beata Holkova, M.D., a hematologist-oncologist at Massey and co-investigator on the clinical trial. As a result, the team is developing a Phase II clinical trial with the National Cancer Institute to test the effectiveness of this drug therapy.

## TOO MANY SCREENING OPTIONS TOO OFTEN AVOIDED

Massey researchers, led by Resa 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 3,350 patients 50 to 75 years old who visited their doctor at least once in the past two years. Researchers found that 56 percent of respondents who had discussed two or more colorectal cancer screening options were 1.6 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 socioeconomic factors that may contribute to patient confusion about colorectal cancer screening in the hopes of conducting a randomized trial to increase screening.

## 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.

Currently, treatment for multiple myeloma consists of using chemotherapy in conjunction with agents that target and block cancer cells from spreading, known as Chk1 inhibitors. However, cancer cells have been able to withstand these agents due to the fact that, as the cells are targeted, they activate a defensive protein known as ERK1/2.

According to the study's lead investigator, Steven Grant, M.D., the Shirley Carter Olsson and Sture Gordon Olsson Endowed Chair in Oncology and professor of internal medicine, by introducing another group of targeting agents, known as Src inhibitors, researchers were able to prevent the activation of ERK1/2 and found that the two 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.

Funding 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.



## 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. As the

highest level of distinction a cancer center can receive, comprehensive status would make Massey one of only 42 equally recognized centers in the country and the only one of its kind in the state.

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 mda-7/IL-24.

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 responses while having no ill effects on normal, healthy cells.

This research, funded by NIH grants and the National Foundation for Cancer Research, builds upon prior studies by principal investigator Paul B. Fisher, M.Ph., Ph.D., Thelma Newmeyer Corman Endowed Chair in Oncology Research at VCU Massey, professor and chair of the Department of Human and Molecular Genetics in the School of Medicine and director of the Institute of Molecular Medicine, who said that, "Although our studies focused on prostate cancer, in principle, they could be applied to many other cancers."

## MITOCHONDRIA: A MIRROR OF POSSIBILITIES

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

In the nucleus of mammalian cells, 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 switched 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.

## NEUROLOGY



## 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.

Malgorzata Dukat, Ph.D., associate professor in the Department of Medicinal Chemistry, and Galia R. Abdrakhmanova, 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.

Aron H. Lichtman, Ph.D., and Laura E. Wise, Ph.D., professors in the Department of Pharmacology and Toxicology, are targeting the cannabinoid system to treat Alzheimer's disease. Cannabinoids have been demonstrated to inhibit or reduce the deposition of beta-amyloid plaques found in the brains of Alzheimer's patients, and this study will evaluate whether a drug that prevents degradation of endocannabinoids (chemical substances in the body resembling organic chemicals found in cannabis) will prevent the development of learning and memory deficits, as well as the neuropathological markers of Alzheimer's.

## 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 glioblastomas, 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 stave off 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.



## SUSTAINED PROTECTION IN TBI TREATMENT

VCU researchers began work on a nationwide study examining the use of progesterone, a steroid hormone that occurs naturally in the body, to treat patients with acute, severe traumatic brain injuries. The NIH Phase III clinical trial, called ProTECT III, is being conducted at 17 institutions in the country, with VCU Medical Center being the only participating hospital in Virginia.

Previous studies have suggested that progesterone, given immediately after a traumatic brain injury, or TBI, may reduce brain swelling and damage. This study will examine if treatment with progesterone for the first four days following a TBI improves outcomes for these patients.

TBI is a major cause of premature death and disability worldwide. In the U.S., approximately 2 million Americans sustain a TBI annually, leading to 50,000 deaths and 235,000 hospitalizations. As yet, no therapy has been found to be effective for reducing mortality and improving functional outcomes.

## 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) are 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 those groups of neurons to form lasting connections, called synapses.

With grants from the Thomas F. Jeffress and Kate Miller Jeffress 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 those 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.

However, Richard M. Costanzo, Ph.D., professor of physiology and biophysics, otolaryngology, neurology, and anatomy in the School of Medicine, said that since olfactory tissue from the nose can regenerate, make new olfactory receptor cells and has the potential to establish connections with cells in the brain, olfactory transplants may provide a novel way to repair or restore smell function.

In January 2011, he and a team reported the successful transplantation of olfactory tissue directly to the olfactory part of the brain in mice, which could possibly lead to a new method for restoring loss of smell in patients with anosmia.

The work was supported by grants from the National Institutes on Deafness and Other Communication Disorders, and the Richmond Eye and Ear Health Alliance Foundation.



Michael A. Fox, Ph.D. (right), Department of Anatomy and Neurobiology, and doctoral candidate Chris Waggener

## 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 Jeffress 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 responds to auditory stimuli in order to determine orientation. And, in deaf animals, they found that the same portion of the brain that responded 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.



Richard M. Costanzo, Ph.D., Department of Physiology and Biophysics

## WOMEN'S HEALTH

## 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 sickness 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 hypertensive reactivity of blood vessels.

Until those 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 Eunice Kennedy Shriver National Institute of Child Health and Human Development, Fogarty International, the Bill & Melinda Gates Foundation, the NIH, and Consejo Nacional de Ciencia Y Tecnología.

## PEDIATRICS

## 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 others 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.



Jo Lynne W. Robins, Ph.D., R.N., ANP-BC, AHN-C, CHTP, School of Nursing

## MARRYING MIND AND BODY

School of Nursing researchers embarked on a series of projects supported by a five-year NIH grant to study the role of stress in the body's immune response and have entered the clinical stages of two trials aimed at examining mind-body approaches to disease prevention and control.

One such project, led by Jo Lynne W. Robins, Ph.D., R.N., ANP-BC, AHN-C, CHTP, assistant professor, aims to measure the effects of tai chi on stress, fatigue and mood, as well as cholesterol, blood sugar, insulin and inflammation in women ages 35 to 50. Researchers hypothesize that imbalances in the body occur years before a diagnosis such as diabetes or heart disease and that mind-body approaches like tai chi can decrease or delay disease onset.

Another project, headed by assistant professors Nancy Jallo, Ph.D., RNC, FNP-BC, WHNP-BC, CNS, and Victoria Menzies, Ph.D., R.N., PMHCNS-BC, seeks to study how the use of guided imagery in women suffering from fibromyalgia and prenatal stress can decrease pain intensity, fatigue and depression, as well as perceived stress, by asking patients to imagine an internal reality with more pleasant sensations than their external realities. By lessening perceived stress in this way, researchers contend, actual stress can then be lessened accordingly.

## 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] pivotal 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 is a very exciting thing because now we have a scientific basis to start treating depression in mothers aggressively, actively and side-by-side, not ignoring what's going on with children in the household, because we know they're at great risk," Sood said.

## THE SECRET INSIDE THE GREENS



Pauley Heart Center researchers have channeled their inner Popeyes, showing that high doses of inorganic nitrate, like the kind found in spinach and other leafy greens, may reduce heart damage caused by the commonly used anti-cancer drug doxorubicin.

While doxorubicin is effective in fighting cancer, it also destabilizes mitochondria, which can lead to heart failure. The only drug approved to combat this side-effect, however, researchers contend, may hinder blood cell production in bone marrow and interfere with doxorubicin's effectiveness as a cancer-fighting agent.

However, the team, led by principal investigator Rakesh C. Kukreja, Ph.D., the Jeanette and Eric Lipman Chair in Cardiology in the School of Medicine and the scientific director of the Pauley Heart Center, found that combining doxorubicin with the inorganic nitrate found in leafy greens reduced the rate of heart dysfunction due to the nitrate's ability to stabilize mitochondria.

The study was funded by the National Institutes of Health, the American Heart Association, and the U.S. Department of Veterans Affairs.

## PRE-EMPTIVE STRIKE AGAINST ATTACKS

VCU is one of four institutions participating in a research network, supported by a nearly \$9.6 million grant from the National Heart, Lung, and Blood Institute, to examine cardioprotective therapies at the preclinical level.

A preconditioned or pretreated heart has an improved ability to produce nitric oxide, 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.



B. Mayer Grob, M.D. (left),  
Department of Surgery, and  
Mitchell S. Anscher, M.D.,  
Department of Radiation Oncology

## 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 weeks 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 planted directly inside a patient's tumor or the area of a surgically removed tumor," said

Mitchell S. Anscher, M.D., lead investigator of these trials and the Florence and Hyman Meyers Chair of Radiation Oncology at Massey. "Unfortunately, healthy tissue is inevitably exposed to some amount of radiation in either technique. Using medical advances, including those being tested in our clinical trials, we hope to maximize the cancer-killing capacity of radiation therapies while protecting nearby organs."

Another clinical trial at Massey uses the drug lovastatin (also known as Altacor, 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 in 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.

## FINDING THE PERFECT RESEARCH MATCH

VCU became one of 56 institutions to participate in a national volunteer recruitment registry, allowing people within the Richmond community who want to participate in research studies the ability to connect online with researchers by joining the not-for-profit ResearchMatch.org.

Once registered in the ResearchMatch system, volunteer recruits are alerted to specific studies that may be of interest to them, and they can then make the decision to release their personal information to the particular researcher or institution.

"This nationwide registry will bring together volunteers and researchers, ultimately helping move research forward," said John Clore, M.D., associate vice president for clinical research and principal investigator for the Center for Clinical and Translational Research at VCU. "This tool helps improve the way biomedical research is conducted and takes us a step closer to finding answers that could make a real difference for the health of many in the Richmond community."

VCU's inclusion in the recruitment registry was made possible through the university's \$20 million Clinical and Translational Science Award from the NIH committed to furthering translational science.

## A COMMON DRUG WITH NEW PURPOSE

In the course of studying the biological processes of cancer progression, finding new purposes for known drugs can make radical improvements to cancer treatments. That's what Massey researchers are in the process of determining through a clinical trial offered in collaboration with the NCI.

Researchers are studying whether adding the common anti-convulsive drug valproic acid to standard radiation and chemotherapies could help patients suffering from glioblastoma multiforme, the most aggressive form of brain cancer.

"We have only recently learned of the radiosensitizing effects of histone deacetylase (HDAC) inhibitors such as valproic acid on cancer cells," said the co-lead investigator of this trial, Michael Chang, M.D., assistant professor of radiation oncology and chief of the Radiation Oncology Service at Hunter Holmes McGuire VA Medical Center. "HDAC inhibitors have been shown to limit tumor growth by inhibiting genetic expression that proliferate cancer cells. This, in turn, helps increase the cancer-killing capacity of radiation therapies."

As part of the trial, patients will receive radiation therapy for six-and-a-half weeks, throughout which valproic acid will be administered orally. Patients will then be monitored for up to three years following treatment.

## CLINICAL TRIALS

### 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 preventions for early, advanced, metastatic and invasive stages of the disease.

"Whether through new techniques or drugs that work on a molecular level, clinical trials bring promising 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."

While the Food and Drug Administration has ruled that Avastin should no longer be used to treat metastatic breast cancer, a multinational Phase III clinical trial headed by Bear has shown that the drug significantly increased tumor response rates in breast cancer patients when given before surgery.

Another ongoing trial, NSABP B-39, aims to shorten radiation treatments from five days a week for up to seven weeks to just twice a day for two to five days by comparing the effectiveness of whole breast irradiation to partial breast irradiation in women with stage 0, I or II breast cancer who have undergone lumpectomies.



Harry Bear, M.D., Ph.D., Division of Surgical Oncology

Researchers also are currently studying data gleaned from the NSABP B-41 clinical trial, which tested the beneficial effects of a new targeted drug combination, lapatinib (also known as Tykerb) and trastuzumab (also known as Herceptin), on patients with HER2-positive breast cancer who have not yet had surgery. Conventional therapies often target and block receptors of HER2 protein; however, this therapy seeks to block the action of HER2 proteins within the cell. After drug therapy, patients will undergo surgery to remove any remaining tumor, and tissue samples will be analyzed to compare the effectiveness of this treatment against the conventional therapy.

Organizational accolades and individual appointments and awards received in 2011 prove our pre-eminence in education, employment and patient care.



Jalana McCasland, Ambulatory Care Center, with her children

## TOP COMPANY FOR PROFESSIONAL WOMEN

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 GRE 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.

## RICHMOND'S EMPLOYER OF CHOICE

The VCU Health System was named 2011's Greater Richmond Area Employer of Choice, marking the fourth time the health system has received the honor. The award recognizes that the health system, as the region's largest employer, with more than 8,600 employees, embodies an honored set of principles and a culture characterized by satisfied employees.

"This is a humbling honor for us," said Sheldon M. Retchin, M.D., M.S.P.H., CEO of the VCU Health System and vice president for VCU Health Sciences, at the All Star Awards ceremony. "But really, this award acknowledges everyone in the room for their efforts to make Richmond a great place to live and work."

The health system also received the national Alfred P. Sloan Award for Business Excellence in Workplace Flexibility. Both awards were given at the annual presentation by the Greater Richmond Chamber, the Richmond Times-Dispatch and Richmond Society of Human Resource Management.

## BEST BUSINESS FOR WORKING MOMS

*Working Mother* magazine named the VCU Health System as one of the nation's 100 Best Companies of 2011 for working mothers, marking the seventh time the health system has been included on this prestigious roster. The magazine recognized the VCU Health System for several initiatives that met the needs of working mothers' flexibility, reaping big rewards through increased productivity, better employee loyalty and even lower absenteeism.

## INDIVIDUAL APPOINTMENTS AND AWARDS

**Edward F. Ansello, Ph.D.**, School of Allied Health Professions, received the Tibbitts Award and delivered the Tibbitts Award lecture, Association for Gerontology in Higher Education. **(A)**

**Robert L. Balster, Ph.D.**, Department of Pharmacology and Toxicology and the VCU Institute for Drug and Alcohol Studies, selected as a 2011-12 Jefferson Science Fellow, U.S. Department of State. **(B)**

**Gretchen M. Brophy, Pharm.D., BCPS, FCCP, FCCM**, School of Pharmacy, elected to the board of directors, Neurocritical Care Society.

**Brian Cassel, Ph.D.**, Massey Cancer Center, received a Fulbright Scholar Award.

**Charles E. Chalfant, Ph.D.**, Department of Biochemistry and Molecular Biology, awarded the Avanti Young Investigator Award in Lipid Research, American Society for Biochemistry and Molecular Chemistry.

**Jeffrey Delafuente, M.S., FCCP, FASCP**, School of Pharmacy, elected 2011-12 vice president, American Society of Consultant Pharmacists.

**Alan Dow, M.D.**, School of Medicine, named member of the first class of Macy Faculty Scholars, Josiah Macy Jr. Foundation.

**Shirley Gibson, R.N.**, VCU Health System and School of Allied Health Professions, received the 2011 NP Advocate Award, American Academy of Nurse Practitioners. **(C)**

**Jean-Venable "Kelly" R. Goode, Pharm.D., BCPS, FAPhA, FCCP**, School of Pharmacy, received the Daniel B. Smith Practice Excellence Award, elected as three-year trustee, American Pharmacists Association.

**Steven Grant, M.D.**, Massey Cancer Center, asked to serve on the Investigational Drug Steering Committee (IDSC) and as IDSC Lymphoma Expert and Liaison to the Lymphoma Steering Committee, National Cancer Institute.

**Spencer E. Harpe, Pharm.D., Ph.D., M.P.H.**, School of Pharmacy, appointed to the editorial board, *Journal of the American Pharmacists Association*.

**Samuel Jones, M.D.**, VCU Fairfax Family Medicine Residency Program, awarded the Nikitas J. Zervanos Outstanding Program Director Award, Association of Directors of Family Medicine Residencies.

**Kenneth Kendler, M.D.**, Department of Psychiatry, received the 2011 ISPG Ming Tsuang Lifetime Achievement Award, International Society of Psychiatric Genetics; awarded the Jean Delay Prize, World Psychiatric Association.

**Debra Lyon, Ph.D., R.N., FNP-BC, FNAP**, School of Nursing, inducted as 2011 Fellow, American Academy of Nursing.

**William McKinley, M.D.**, Department of Physical Medicine and Rehabilitation, received the Leonard Tow Humanism in Medicine Award, Arnold P. Gold Foundation; named Community Partner of the Year, Spinal Cord Injury Association of Virginia. **(D)**

**Leticia Moczygemba, Pharm.D., Ph.D.**, School of Pharmacy, received a Best New Investigator Podium Research Presentation Award, International Society for Pharmacoeconomics and Outcomes Research.

**John Nixon, M.D.**, VCU Pauley Heart Center, received the Award of Meritorious Achievement, American Heart Association. **(E)**

**John M. Pellock, M.D.**, Department of Neurology, named president, American Epilepsy Society.

**John T. Powlischock, Ph.D.**, Department of Anatomy and Neurobiology, awarded honorary degree, University of Pécs in Hungary.



**Jo Lynne W. Robins, Ph.D., R.N., ANP-BC, AHN-C, CHTP**, School of Nursing, inducted as a 2011 Fellow, American Academy of Nurse Practitioners.



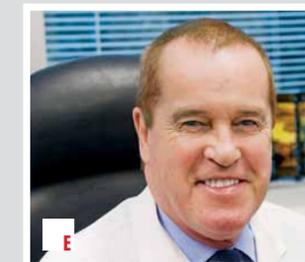
**Kevin Shimp, R.N.**, School of Nursing, named 2011 Man of the Year, Leukemia & Lymphoma Society; earned a 40 under 40 Award, Virginia Nurses Foundation.

**Joel Silverman, M.D.**, Department of Psychiatry, appointed to the Board of Regents, The American College of Psychiatrists. **(F)**



**Evan M. Sisson, Pharm.D.**, School of Pharmacy, appointed to the editorial board, *Diabetes Health*.

**J. Tyler Stevens, Pharm.D.**, School of Pharmacy, earned Chapter Advisor the Year Award, National Phi Delta Chi Grand Council.



**Douglas Sweet, Ph.D.**, School of Pharmacy, named vice chairman, Pharmacokinetics, Pharmacodynamics and Drug Metabolism Section, American Association of Pharmaceutical Scientists.

**Mary A. Turner, M.D., F.A.C.R.**, Department of Radiology, awarded the Lifetime Achievement Award, Society of Gastrointestinal Radiologists. **(G)**



**Jurgen Venitz, M.D., Ph.D.**, School of Pharmacy, selected to represent the Myasthenia Gravis Foundation, 2011 Drug Information Association 47th Annual Meeting's first Patient Advocacy Fellowship Program.

**Laura E. Wise, Ph.D.**, Department of Pharmacology and Toxicology, received the Young Investigator Award, National Alliance for Research on Schizophrenia and Depression.



**Nancy Yunker, Pharm.D.**, School of Pharmacy, received the Adult Medicine PRN Mentoring Award, American Association of Clinical Pharmacy.

# CAPITAL CONSTRUCTION

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 to outpatient facility
- On-site, state-of-the-art, 3-D radiation treatment planning simulator
- Linear accelerator radiation treatment machine
- Seven chemotherapy treatment rooms, 10 exam rooms

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

2002

## GATEWAY BUILDING

- \$59 million
- Nine levels, 215,900 square feet
- MCV Hospitals' new front door, connecting Main Hospital to Nelson Clinic and creating a central entrance for both patients and families
- State-of-the-art imaging center including a high-resolution 3.0 Tesla MRI scanner and cyclotron, and computer-based digital imaging management system

2007

## SCHOOL OF NURSING BUILDING

- \$17.1 million
- 70,000 square feet
- First building at VCU constructed solely for the purpose of educating future nurses
- Clinical learning center with high-tech patient simulators
- 150-seat auditorium, research laboratories and a community outreach nursing center



2007

## HUNTON STUDENT CENTER

- \$6 million renovation of historic 166-year-old church
- Three-story center serves as the first student commons for the MCV Campus
- One of five recipients of the Association of College Unions International Facility Design Award

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 overnight stays by parents
- Home of the Evans-Haynes Burn Center, the region's only resource for the care of acute burns 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



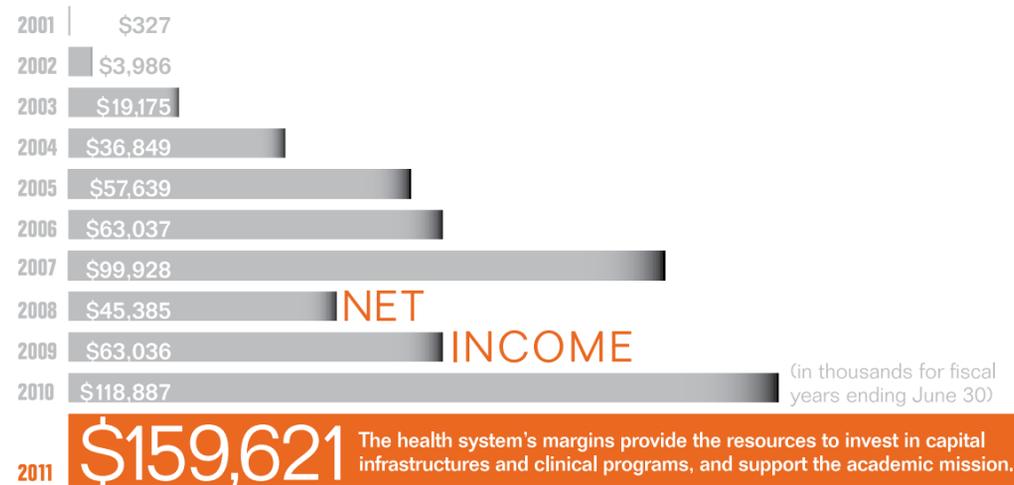
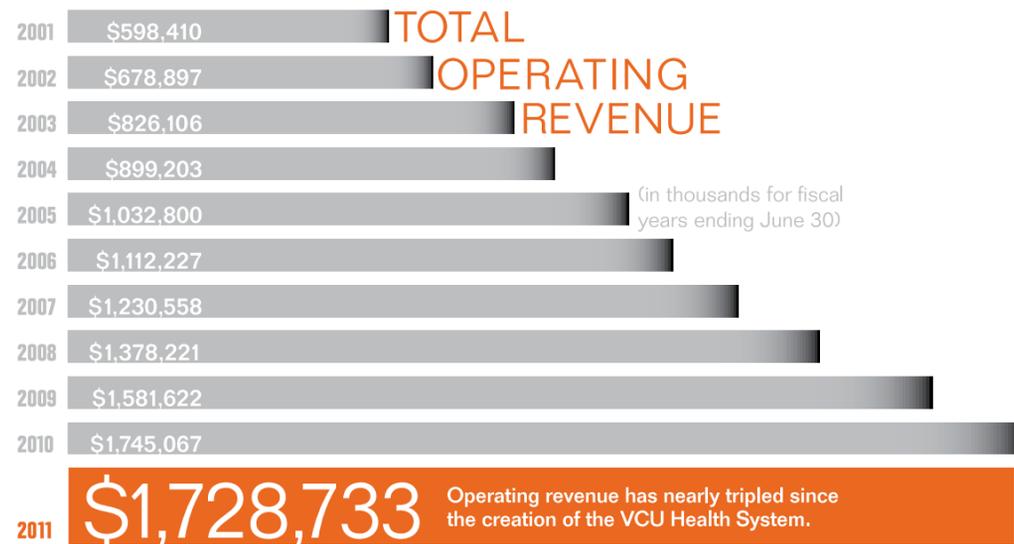
# FINANCES AND GROWTH

## VCU HEALTH SYSTEM FINANCIAL STATEMENT\*

(in thousands for fiscal years ending June 30)

<b>Total operating revenue</b>	<b>\$1,728,733</b>	<b>Salaries, wages and benefits</b>	<b>\$695,897</b>
<b>Total operating expenses</b>	<b>\$1,583,562</b>	<b>Supplies</b>	<b>\$229,259</b>
<b>Net operating income/(loss)</b>	<b>\$145,171</b>	<b>Purchased services and other expenses</b>	<b>\$158,984</b>
<b>Nonoperating revenues and expenses</b>	<b>\$14,450</b>	<b>Depreciation and amortization</b>	<b>\$60,640</b>
<b>Net income/(loss)</b>	<b>\$159,621</b>	<b>Medical claims expense</b>	<b>\$438,782</b>

\* 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)



## 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.

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