Research

FALL 2006

Darwin  Recidivism  Telesurgery  The Modern Plague
Aristotle’s philosophy that “no coopora nisi fluida” (no reaction occurs without solvent) isn’t holding water.

JAMES MACK II, PhD, assistant professor of chemistry and one of the leading researchers in a new field of “green chemistry,” is finding ways to create reactions without solvents.

In traditional chemistry, a liquid is used to dissolve solids and the liquid is thrown away. This practice has contributed to billions of gallons of liquid waste. Nevertheless, as environmental protection has evolved, so is chemistry evolving.

To reduce the solvent waste in organic synthesis, Mack focuses on solid-state organic synthesis through the use of high-speed vibrational milling. Researchers place solid crystals or powders inside a steel vessel with a steel ball, which is then shaken at high velocities. The agitation forces the ball to pulverize the reagents, causing them to react. What’s left is a salt, which is washed away with minimal amounts of water.

The environmental laws of the 1970s focused on cleaning up pollution. Today’s environmental policies look toward preventing pollution and evaluating processes over their lifetimes, not just the one step of the reaction itself.
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UC’S LIBRARIES ONCE AGAIN RANK AMONG THE TOP 50 U.S. AND CANADIAN RESEARCH LIBRARIES, according to the most recent Association of Research Libraries (ARL) rankings. The libraries (University Libraries, Academic Health Center Libraries and the Law Library) took their spot at number 47 among the 113 ranked. To compile their list, ARL considered the total number of volumes held, volumes added, current serials, total library expenditures and staffing. In addition, ARL benchmarks reference transactions, circulation of books and other items, interlibrary lending and library instruction.
‘Playing Games’ With Stroke Patients

Kari Dunning, PhD, was skeptical at the thought of her stroke patients playing video games as part of their rehabilitation. But Dunning, an assistant professor in the rehabilitation sciences department of the College of Allied Health Sciences, says patients find this new form of rehabilitation, in this case for leg muscles, not only challenging but also lots of fun.

A member of the Neuromotor Recovery and Rehabilitation Laboratory at UC and the Drake Center, Dunning is determining whether a computer-assisted video game can improve balance and walking in patients who are more than one year post-stroke. Her work is supported by a four-year, $259,000 grant from the American Heart Association.

To “play the game,” the patient sits in a chair with the affected leg on a block or foot stool. Electrodes attached to the calf send feedback into the computer.

Biofeedback equipment built into the video game allows patients to watch their progress as they relearn to use muscles whose function has been limited by stroke.

The therapist conducts an initial threshold test to verify the patient’s range of ankle motion, which sets the game at an individualized “level.” On the computer screen are a series of video games that patients then work through at their own pace. Rather than using a joystick, however, they play the game by flexing and extending their foot.

It’s lack of ankle control that causes walking difficulty among many stroke patients, Dunning says. And this can be a major problem, because the foot may then drag or drop during walking, which can lead to falls.

Impacting Where We Live

Research at Ohio’s largest public universities has a major impact on the economy of the state.

A study released in August—commissioned by UC, Case Western Reserve University and Ohio State University—placed the economic impact of these three institutions on Ohio at $6.2 billion. The findings, based on 2004 data, suggest the three universities account for 80 percent of university-based research in the state.
Seeking Clues to Ovarian Cancer

The American Cancer Society estimates that 3 percent of new cancer cases in women begin in the ovary, and 6 percent of cancer deaths result from ovarian cancer. Researchers know it’s not tumors in the ovary that lead to death, but rather the spread (metastasis) of these tumor cells to other parts of the body. And this spread often happens before the cancer has even been detected.

A scientist at UC’s Genome Research Institute hopes a research grant from the American Cancer Society will ultimately help save lives from this devastating disease. Angela Drew, PhD, will use a four-year, $712,000 grant to further study how ovarian tumor cells metastasize.

Drew’s team has already shown that ovarian tumors utilize inflammatory cell proteins to spread. By targeting those interactions, the team hopes to reduce the metastasis that leads to the high rate of mortality among ovarian cancer patients.

Driving Away With the Prize

In the world of automotive design, no one accepts second best. In fact, the specialty of auto design is so highly competitive that, in some years, entire graduating classes of young designers from the nation’s five transportation tracks are passed over by auto makers. That being the case, UC’s respected transportation track received an “A+” from two automakers last spring—General Motors Inc. (GM) and DaimlerChrysler—in the form of summer work offers to three juniors in UC’s top-ranked College of Design, Architecture, Art, and Planning.

In extremely intensive portfolio reviews and interviews, in which they competed against hundreds of the best applicants from the nation’s transportation tracks and industrial design programs, Mark Chrapla, 22, of Indianapolis, and Matt Zoller, 22, of White Oak, Ohio, earned summer cooperative education slots at GM. Taryn Dyle, 22, of Detroit, spent her summer with DaimlerChrysler.
GETTING THE LEAD OUT

UC environmental health researchers Kim Dietrich, PhD, and Bill Menrath were brought on board this summer to help Cincinnati better understand the long-lasting health effects of lead exposure, and to formulate solutions to rid some of the area’s homes and businesses of this toxic heavy-metal element that’s been linked to learning and behavioral problems in children.

Their voluminous research—and Menrath’s work in developing “Smart Streets,” a successful lead-abatement program in Cincinnati’s aging Over-the-Rhine district—made them the perfect resource when it came to improving quality of life and health for the city’s residents.

In other lead news, UC professor Scott Clark, PhD, published a study in the September 2006 edition of Environmental Research citing dangerously high levels of lead still being added to paints in India, China and Malaysia.

Clark and his team say this lead-based paint production poses a global health threat, and a worldwide ban is urgently needed to avoid future public health problems.

Playground equipment—like these climbing bars in Mangalore, India—might actually be hurting children.

THE LEAD-ABATEMENT PROGRAM “SMART STREETS,” developed by UC environmental health experts, was recognized by the university in a series of radio and print advertisements for the “It’s All UC” campaign. Led by Judy Jarrell and Bill Menrath, in conjunction with the Cincinnati Job Corps, “Smart Streets” has eliminated lead from 20 Over-the-Rhine properties that are now used for housing and small businesses.
Preventing Childhood Obesity

As the waistlines of children continue to grow, so does concern about childhood obesity. Two UC researchers are hoping to fight this problem with a new intervention program created for elementary schoolchildren. Graduate student Megan Canavera and associate professor Manoj Sharma, PhD, of the College of Education, Criminal Justice, and Human Services, are partnering with a Meade County, Ky., school to test the effects of regular physical activity, healthy eating habits, limited TV watching and parent-child communication. The two hope their findings will lead to the prevention of obesity among school-age children. The study is funded by a $5,000 Ann A. Hertzler Award from the American Dietetic Association Foundation.

Warning on Skin Cancer

New research from the University of Cincinnati shows that dark-skinned people—commonly thought to be “immune” to most skin cancers—are more likely than whites to die from skin cancer and its related complications. Hugh Gloster, MD, associate professor of dermatology, says that dark-skinned people—including blacks, Asians, Hispanics and Native Americans—develop fewer nonmelanoma skin cancers compared with whites. But when the disease does occur, it is typically more aggressive and diagnosed in its later stages, which leads to disproportionately more deaths among minority populations.

This research was presented in July at the summer meeting of the American Academy of Dermatology in San Diego.
The Beagle, the Battlefield and Beyond

When Charles Darwin once again set foot on English soil after his epochal circumnavigation aboard HMS Beagle, he had changed the world, and humankind’s view of it, as surely as the pioneer in our time who said, “That’s one small step for man; one giant leap for mankind.”

Both those adventures still stir hearts and minds in today’s world, and the excitement (if not the ire sparked by Darwin’s “dangerous” ideas), lives on at UC.

In this edition of UC Research you will read how biological scientist Ken Petren, PhD, is using the same Galápagos fauna that Darwin studied, not only to support the controversial theory of evolution, but also to help preserve our environment. And the famous footprint that former UC faculty member Neil Armstrong left on the moon in 1969 blazed a trail that’s being followed by researchers like UC’s Timothy Broderick, MD, who knows that when humans take to the battlefield or venture to the moon and beyond, “telesurgery” must surely follow.

You will read more about this exciting research, plus down-to-earth endeavors to help prison inmates learn how to break the cycle of recidivism and UC’s leading role in fighting the AIDS epidemic. Any way you look at it, research at the University of Cincinnati is “out there”—addressing issues and solving problems that range from the technological wizardry of a Star Trek-like adventure, to the struggles of everyday people whose lives are in upheaval.

We welcome your comments and questions about the stories you find in this edition of UC Research.
Ken Petren’s research is for the birds. And the lizards.
But his genetic studies of Charles Darwin’s famed Galápagos finches, not to mention the rowdy social life of South Pacific geckos, are **PRETTY SERIOUS STUFF.**

**Survival of the Finches**

*By Wendy Beckman*

*Photos by Lisa Ventre*
An associate professor of biological sciences, Ken Petren, PhD, is using UC’s latest analytical technology to confirm and extend what Darwin observed in 1835 during his visit to the Galápagos Islands, and later developed in his seminal work *The Origin of Species*.

Petren is also studying the colonization of geckos—that’s the nocturnal house variety as opposed to a green, day gecko (the Cockney-accented one currently peddling insurance on TV)—in the hope of improving their conservation and management.

The Galápagos archipelago, off the coast of Ecuador, comprises 13 major islands and over 100 smaller islands and islets spread over about 50,000 square miles of the eastern Pacific Ocean.

A century after Darwin’s sojourn there, the Ecuadorian government recognized the fragility of this environment and set aside 90 percent of the then-uninhabited area as a national park. They were just in time. Galápagos tourism exploded in the 1960s. Small wonder, when tour guides tout constantly sunny skies, relaxing sea breezes, turquoise-blue ocean and sandy beaches of “crystal white, pink, volcanic black and looking-glass green.”

But with recent increases in both population and tourism, the island species are not as isolated as they once were. This potentially damaging confrontation, however, gives researchers another area in which to examine invasive and native species interactions.

Scientists have spent decades seeking evidence to support Darwin’s theory that the Galápagos finches evolved from one species common to the Pacific coast of South America. Within the islands, the finches have adapted to their habitat, especially to different sources of food.

This evolutionary accommodation is reflected in the
THE GALÁPAGOS ISLANDS are ideal for biological study. At first, their remoteness appealed to biologists for research. Historically there was little interaction between the islands and the mainland, so it was—as Charles Darwin wrote in *The Voyage of the Beagle*—“a little world within itself.”

The population grew from about 10,000 in 1990 to almost 30,000 by 2005. Tourism to the Galápagos Islands has more than doubled over the past 15 years, from about 41,000 tourists a year in 1990 to more than 100,000 in 2005.

With the increase in visitors comes a greater risk of invasive species tagging along. And although some tourists follow conservation guidelines, many do not.

The Galápagos Islands are also famous for another animal: the giant tortoise. Although abundant in Darwin’s day, they are disappearing. It’s estimated that hunters and poachers killed over 100,000 tortoises in the 19th and 20th centuries. Invasive species, both intentional (such as goats) and accidental, have also devastated habitat. Four subspecies have become or are becoming extinct, and fewer than 15,000 tortoises remain on the islands today.

There is, however, a major initiative under way to rid several large islands of goats.

The increase in the archipelago’s popularity is a double-edged sword for the Ecuadorian government. Although tourism represents much-needed income, the ecological damage the tourists cause threatens the very same tourist economy. Globally, the traffic also threatens species populations and their habitats, so the Ecuadorian government is taking steps to control both population and tourism.
Their studies genetically compare tissue from present-day finches with samples taken from museum specimens of birds collected by Darwin himself.

Petren points out, however, that not just anyone can remove tissue samples, which can be as minuscule as a slice of one toe pad, from Darwin’s originals.

“You have to make a very strong argument to do destructive testing like this,” he says. “The tissue we take could possibly change the way we perceive and place a value on isolated populations of many other species around the globe.”

Petren and his team bring their samples back for genetic analysis at the Center for Genome Information, in UC’s environmental health department.

The team’s findings so far show that similarity in finches is unrelated to the proximity of their various islands. Instead it appears to depend on similarities of habitat on their home islands, which can range across the archipelago from low and dry to high and moist.

“People tend to assume most animals move and settle randomly,” Petren explains. “Using the tools of molecular genetics, however, we picked up a signature that suggests they’re selecting where to settle based on habitat, and this is factoring into the formation or divergence of species.”

Ken Petren, PhD, associate professor, and WISE student Ninnia LesCano sort blood samples from Sierra Negra finches collected in the Galápagos Islands. These samples will be sent to the lab for DNA analysis.

size and structure of the birds’ bills. For example, vegetarian finches and ground finches have beaks best suited for crushing. Warbler, cactus and woodpecker finches have long, slender bills ideal for probing insects out of crevices.

The woodpecker finch even uses twigs as tools for digging out food deeper than the reach of its beak, and the vampire finch actually pecks at the tail feathers of seabirds to draw blood as a food source.

Ever since joining UC’s faculty in 2000, Petren has been taking teams of faculty and students to the Galápagos Islands to study how various species thrive and evolve. He’s seeking genetic clues as to how one ancestral Galápagos finch evolved into 15 different species. His research team—collaborating with Princeton University Darwin finch specialists Peter and Rosemary Grant and supported by the National Science Foundation—is working to reconstruct the history of populations and species.
From Finches to Lizards
To better understand how communities of organisms form, Petren’s lab also studies how house geckos hitchhiked with the original Polynesian and Melanesian islanders, and continue to spread with the help of humans across the Pacific islands.

“We use geckos as a model to understand how invasive species succeed and displace residents,” Petren explains. “Humans are moving geckos around a lot. Some species are residents, having reached the islands thousands of years ago. More recently, however, other species are being introduced by accident with cargo, and sometimes people bring them in for the pet trade.”

Petren says that behavior often determines whether a species can successfully colonize a new habitat and whether it spreads rapidly and affects native species.

He duplicates the geckos’ natural environment as best he can for the 300-plus South Pacific lizards in his lab so he can examine them as they eat, socialize and fight.

Documenting the geckos’ visual displays—which include tail wags and arches, vocalizations, approaches and retreats, bite-holds, wrestles, licks and copulations, even throwing each other off the wall—the researchers found that social interaction between invasive and native species, not just competition for resources or aggression on the invaders’ part, plays a significant role in species turnover.

“Increase in global trade and travel is slowly bringing the world’s biota together,” Petren says, “so we’re bound to lose a great deal of biodiversity in the process. But understanding how species are displaced is the first step in understanding how the process can be managed.”
“Jacques Cousteau,” he answers definitely. “There’s a whole generation of us who watched his specials.” Petren was told “only one in a million” could become a marine biologist, so he pursued premedicine as an undergraduate at Princeton. By his senior year, however, he had changed majors. That’s when he was bitten by the biology research bug. “I loved the idea that you could pick a research topic, read about it, think up questions, and go get the answers,” he says. “It all depended on how clever you were and how good the questions were that you thought up.” Besides doing his own research, Petren heads the undergraduate research and biology honors program in McMicken College of Arts & Sciences. He walks the talk of supporting undergraduate research and passionately supports UC’s Women in Science and Engineering (WISE) program. Through the yearly “Research Experience for Women Undergraduates,” participants conduct actual research side-by-side with university faculty. This year’s trip to the Galápagos included a former WISE undergrad, two master’s students and a post-doc. “I’m committed to undergraduate research,” Petren says, as evidenced by the five undergrads in his lab last spring. “Actually doing a research project changes your whole notion—you’re whole attitude—toward biology.”
One in eight babies is born early. Those born prematurely run the risk of serious complications and often have underdeveloped lungs.

Saving the lives of those babies born before their lungs can catch up has been the focus of one UC doctor.

Jeffrey Whitsett, MD, professor in UC’s Department of Pediatrics and chief of the section of neonatology, perinatal and pulmonary biology at Cincinnati Children’s Hospital Medical Center, is internationally recognized for his lung development research, which has improved the diagnosis and treatment of babies around the world.

When infants are born early, lung function is often limited, because proteins and lipids that make up pulmonary surfactant—a key part of the lung surface—are not yet being made. Without these proteins and lipids, oxygen and carbon dioxide exchange cannot occur, and the lungs may collapse.

Whitsett and his colleagues set out to study these biological molecules.

The result of years of work ... the team identified the proteins and genes that make surfactant function. Surfactant therapy is now standard treatment for respiratory distress syndrome in preterm infants.

Whitsett’s study of lung development has not been isolated to preemies alone. His research also spills over into understanding the causes and management of other diseases affecting children and adults.
Background photo: Centers for Disease Control and Prevention—a highly magnified transmission electron micrographic image revealing mature forms (dotted circle) of the human immunodeficiency virus (HIV) in a tissue.
TEN-TY-FIVE YEARS AGO, an unnamed disease rocked the lives of people in New York and Los Angeles. What began in populations of gay men quickly spread to destroy the lives of countless men, women and children around the world. In fact, the Centers for Disease Control and Prevention (CDC) estimates that the modern plague that became known as HIV/AIDS (human immunodeficiency virus/acquired immune deficiency syndrome) has killed more than 25 million people, including over half a million Americans.

Battleground: AIDS

By Sheryl Hilton
Photographs by Dave Collins

Despite an environment, especially in the early days, in which fear of AIDS daunted even the caregivers, teams of researchers and physicians put aside their own concerns, ignoring the canon of myth and corrosive stereotyping, to begin the long crusade against this unpredictable disease.

University of Cincinnati scientists were no exception. From the early, tentative days of description and identification to the current, continuing scientific battle against a still-mysterious enemy, they have earned acclaim for their contributions.

Here are some of them.

According to CDC data, an estimated 1.1 million people are infected with HIV in the United States, and although the rate of new infections has stabilized over the past five years, 40,000 new HIV infections are diagnosed each year.

In the Greater Cincinnati metropolitan area, including surrounding Kentucky and Indiana counties, an estimated 2,000–5,000 people are living with HIV infection.
Carl Fichtenbaum, MD, medical director of UC’s Infectious Diseases Center, was a medical student in Kansas City 23 years ago when he encountered his first AIDS patient.

Three years later, he met a patient who decided his career.

“I was walking down the hall of a hospital in Bridgeport, Conn., in 1986 when I noticed a tray of food outside a patient’s room,” he says. “A nurse’s aide told me the servers were afraid to enter the room because the patient was HIV-infected.”

Fichtenbaum carried the food to the patient himself.

“He looked up at me and smiled,” he says, “and I could see that despite his illness he was happy that someone was treating him like a human being.”

It was then, Fichtenbaum says, he realized that AIDS patients needed the help he was not afraid to provide.

“While some felt like running away,” he says, “I was motivated to run toward them, with the goal of making a difference. It was scary at the beginning, not because we were afraid of catching the virus, but because of what people would think of us for becoming the ‘AIDS docs.’”

There was no treatment for AIDS at the time, and that first patient returned to the hospital frequently with various infections.

“I remember spending time with him, just with my hand on his shoulder,” Fichtenbaum says. “Many of my patients died during these early years, but it made me feel better knowing that at least this one person could feel a little less lonely.”

In October 2003, Fichtenbaum presented research findings at the Ninth European AIDS Conference in Warsaw, Poland—results that showed the leading cause of hospital admissions among AIDS patients in Cincinnati was cardiovascular disease. Of the 85 HIV patients admitted to University Hospital in 2000 to 2001, Fichtenbaum found that 8.5 percent had cardiovascular disease—compared with 3.4 percent admitted for infections like pneumonia.

Says Fichtenbaum, “Our study results suggested that risk factors for cardiovascular disease should be an important consideration for physicians prescribing HIV/AIDS treatments, particularly in patients over 40.”

One explanation for the prevalence of heart disease in this population is that many people

As a result of Fichtenbaum’s research, HIV-infected patients now have their cholesterol levels monitored carefully and are given statin medications to lower their cholesterol and reduce their risk of heart disease and stroke.
who have been taking anti-retroviral therapy now live long enough to develop cardiac disease. Another theory is that long-term use of medication may potentially cause cholesterol and triglyceride problems, or may damage the walls of arteries.

As a result of Fichtenbaum’s research, which has influenced patient care worldwide, HIV-infected patients now have their cholesterol levels monitored carefully and are given statin medications to lower their cholesterol and reduce their risk of heart disease and stroke.

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Carl Fichtenbaum, MD
Judith Feinberg, MD, director of research at UC’s Infectious Diseases Center (IDC), was a fellow at UCLA in 1982, soon after the first cluster of AIDS cases appeared there.

Her training was marked by the tempo of the epidemic. Her caseload rose from five patients to 10, then 20. By the end of her first year of fellowship, she had seen the first woman with AIDS in Los Angeles.

Feinberg viewed AIDS as the most compelling problem faced by infectious disease physicians.

At that time, most cases were defined by the presence of a lethal pneumonia caused by the micro-organism *Pneumocystis carinii*. *Pneumocystis carinii* pneumonia, or PCP as it is commonly known, became the hallmark of AIDS, along with a skin cancer called Kaposi’s sarcoma.

“What many people don’t know,” Feinberg says, “is that in 1987 UC physicians were among the first to develop a less invasive way of obtaining the lung fluid needed to confirm the presence of pneumocystis.”

Principal investigator of the AIDS Clinical Trials Group grant at UC, Feinberg is nationally recognized for her clinical and research expertise in HIV infection and the design of clinical trials to manage HIV infection.

Earlier diagnostic tests involved obtaining lung tissue using open-lung biopsy, which is major surgery, or by a biopsy taken through a bronchoscope, a tube used to examine the lungs. Then, UC pulmonary researcher Robert Baughman, MD, and IDC founder Peter Frame, MD, worked on a less invasive way to collect the sample for testing. Called BAL (bronchoalveolar lavage), the procedure washes out and suctions a sample of lung fluid.

In 1987 UC physicians were among the first to develop a less invasive way of obtaining the lung fluid needed to confirm the presence of the micro-organism *Pneumocystis carinii*, cause of the lethal pneumonia that, at the time, defined most AIDS cases.
Michael Dohn, MD, later joined Frame and Baughman’s group, and over the next few years they performed over 1,000 lavages to diagnose the cause of pneumonia in AIDS patients. PCP is not the only lung infection that AIDS patients can develop, and successful treatment depends on getting the right diagnosis. This led to over a dozen original reports on AIDS-related pneumonia.

James Stringer, PhD, Peter Walzer, MD, George Smulian, MD, and Melanie Cushion, PhD, all UC faculty and researchers at the Veterans Affairs (VA) Medical Center in Cincinnati, began examining samples to understand the genetic make-up of pneumocystis. Cushion now heads the international Pneumocystis Genome Project.

The BAL technique was also used by UC and VA researchers to study other infections in AIDS patients, including cytomegalovirus, tuberculosis and bacterial infections.

“As a result of these studies,” says Feinberg, “we learned that pneumocystis was a fungus, not a protozoan parasite as had been thought in the past, and that it could be transmitted from person to person. It was research of this caliber that first attracted me to UC.”

With advances in anti-retroviral therapy, PCP is not nearly the problem it was when those studies began.

“Since then, UC researchers have participated in research to find better treatments for other infectious diseases that affect people with HIV, such as hepatitis B and C, cytomegalovirus, cryptococcal meningitis and histoplasmosis,” says Feinberg.

Feinberg strongly supports recommendations from the Centers for Disease Control and Prevention for wider HIV screening by offering tests to everyone between the ages of 13 and 64, regardless of whether or not they have specific risks for HIV.

“Knowledge gives people the opportunity to know their status and act accordingly to prevent the spread of AIDS,” she says. “It’s less expensive to prevent a disease than to treat it, and less traumatic emotionally for the patient, family and friends.”

Judith Feinberg, MD
During the last 20 years, UC researchers have received more than $76 million to study HIV/AIDS and its associated infections.
10 billion virus particles each day. These patients, however, looked healthy for as long as 10 years. Ho advocated multi-drug regimens, later called “AIDS cocktails,” to kill the virus.

- The viral load test was developed, making it possible to measure the amount of virus in the blood, so the physician could adjust the medication. This test showed how well a specific combination of medications was working in a patient.

  “We found that if you could reduce the viral load to below the detectable limit of the test, you also lessened the chance of transmitting the virus to someone else,” Frame says. Less than two years after these findings, the AIDS mortality rate dropped by 80 percent.

  Even though fewer people were dying of the opportunistic infections that usually killed HIV-infected people, researchers noticed that some patients taking the traditional cocktails had higher cholesterol levels and, more alarming, higher rates of stroke and heart attack.

  Physicians also became aggressive about testing and treating pregnant women to prevent transmission of the virus from mother to child.

  Over the last decade, 25 drugs have been introduced, and the multi-pill AIDS cocktail has been reduced to only a handful of medications with fewer side effects. “But we still don’t know the long-term effects of taking these drugs for years, and currently treatment is for life,” Frame says.

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“With more than two decades of research we’ve improved treatment,” he says. “Now we need to find out how to prevent transmission of the HIV virus from one person to another.”

In 2001, Frame received the Watanakorn Clinician Award from the Infectious Diseases Society of America for his pioneering work in AIDS research and care.
Evelyn Hess, MD, now a professor emeritus, headed the internal medicine department’s division of immunology when the first AIDS patients appeared in UC clinics and were diagnosed and treated by faculty and staff of the infectious diseases division.

Before the infectious agent had even been identified, Hess realized this growing epidemic called for a well-organized response, both for patient care and overall public health, a strategy that was to set an example nationally.

The first result was the Greater Cincinnati AIDS Task Force, which Hess chaired.

As the infection gained momentum, UC physicians began treating young men with various rheumatic diseases. Working with New York AIDS expert Friedman Kien, MD, rheumatology/immunology scientists were the first—in 1984—to describe these disorders in the scientific literature. Over six years they published eight more papers on immune and rheumatic disorders in AIDS patients.

Influenced by what was happening here, the Ohio senate soon established a statewide AIDS Task Force, on which Hess represented Greater Cincinnati for three years. With the founding of the Greater Cincinnati AIDS Consortium, the Caracole home for patients, and the AIDS Volunteers of Cincinnati, in which Hess played an important and prescient role, Cincinnati was as prepared as any city in the country to deal with the disease.

In 1999, Hess was named one of the 10 “Women of the Year” in Cincinnati for her contribution to rheumatic diseases and AIDS research, treatment and education.

Hess’s response to the epidemic included establishing and chairing the Greater Cincinnati AIDS Task Force, which influenced the formation of a task force at the state level.
A collaborative partnership between UC, University Hospital and the Health Alliance, the

**Infectious Diseases Center (IDC)** was one of the first services of its kind in the country to be supported by the AIDS Clinical Trials Group, which is funded by the National Institute of Allergy and Infectious Diseases.

**. . . 20 Years On**

The IDC has directly reduced the burden of the HIV epidemic in the Greater Cincinnati area and has trained hundreds of health care providers on the proper management of HIV infection.

Staffed by 41 researchers, doctors, nurses, social workers, pharmacists, counselors and support personnel, the IDC sees about 1,600 HIV patients a year and has treated more than 4,000 Cincinnatians since it officially opened in the old Holmes Hospital in 1986.

In 1995, the death rate peaked with more than 200 patients dying from AIDS in Cincinnati. Improved treatment and convenient access to health care, however, has lowered the mortality rate, and in 2005 the IDC reported only 34 AIDS-related deaths among the 1,600 patients it now sees annually.

Thanks to collaboration between local health departments, UC’s infectious diseases division, the emergency medicine department and University Hospital, patients at the hospital’s emergency department, the IDC and several community health clinics now have access to rapid AIDS testing, education and counseling.

The IDC also provides care and education and collaborates with several community organizations, including AIDS Volunteers of Cincinnati, the housing program Caracole, Crossroads, the Cincinnati Health Network, Cincinnati Health Department and the Hamilton County corrections department.

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**HIV/AIDS isn’t going away.**

Because of education, research and improved treatment, more HIV-infected patients are alive and well, but the rate of new infections in the Cincinnati metropolitan area has not decreased. We can’t slack off now—there is still so much to be done.”

Judith Feinberg, MD
REMOTE OPERATION

It’s only a minor irritation when delayed satellite signals result in an out-of-sync report on the nightly news. But it’s an entirely different story when that signal—delayed by a matter of seconds—is being used by a surgeon to treat a critically wounded soldier thousands of miles from the operating room.

In fact, it could be the difference between life and death.

Now, an unmanned plane, or “drone,” may hold the future for surgery in extreme scenarios, including the battlefield, disasters and remote communities.

Welcome to the world of telesurgery, a method in which a surgeon uses a robot and advanced communications technology to operate on a patient located thousands of miles away ... and eventually on the moon or Mars.

It sounds like something out of “Star Trek.” But University of Cincinnati telemedicine experts are diligently working to test and validate some “far out” medical technologies that will enable physicians to make telesurgery a workable reality.

BY AMANDA HARPER
PHOTOS BY D.A. FLEISCHER
UC experts are at the forefront of nationwide telesurgery experiences that may move them far beyond the traditional operating room.
This summer, UC’s Timothy Broderick, MD, and researchers Chuck Doarn and Brett Harnett met in arid Simi Valley, Calif., with experts from the U.S. Army’s Telemedicine and Advanced Technology Research Center, the University of Washington, and AeroVironment to test the world’s first prototype for mobile robotic telesurgery. Known as the High Altitude Platforms for Mobile Robotic Telesurgery (HAPsMRT), this project used an unmanned drone as the communications connecting point between a simulated patient and a surgeon located in completely different places.

Previous telesurgery projects have relied on streaming video delivered via high-speed Internet or satellite. But in extreme remote locations—such as the barren plains of the Sonoran Desert—satellite communication is often unavailable and, at best, results in delays that make the concept of “surgical precision” a dangerous misnomer.

“It’s impossible to precisely operate on a moving patient when the images you see represent where the patient was a few seconds ago,” explains Broderick.

High-speed communication signals are critical for telesurgery to be practical in day-to-day patient care or extreme environments, like space. Right now, Broderick says, there’s a tolerable few hundred milliseconds lag time from Cincinnati to California but a 20-minute delay between here and Mars. Scientists must find a way to overcome this communication delay before a surgeon can safely operate on a remote patient in real time.

“To make surgery flexible enough to address injuries in these environments, we need a light, robust and portable surgical robot—teamed with a reliable wireless telecommunication system,” says Broderick.

“Mobility will be key for many future telesurgery applications—such as operating on injured soldiers in the battlefield,” Broderick continues. “The drones provide excellent mobile broadband communication. They are like low-flying satellites, and the signal doesn’t have to travel as far. The shorter communications lag time allows us to operate far more effectively.”

Bringing HAPsMRT to fruition required an interdisciplinary team of experts from across the globe. AeroVironment, a California-based manufacturer of unmanned aerial vehicle systems, developed a version of their Puma model—a drone currently used on the battlefield to gather intelligence on enemy troop movements—equipped with wireless broadband technology instead of cameras. The University of Washington BioRobotics Lab provided the surgical robot—the first model
that’s light, portable and technically sophisticated enough for mobile use in the desert. UC brought the surgical, telecommunications and telemedicine expertise necessary to bring it all together.

“Achieving consistent, high-quality communication with short transmission delays is the key obstacle that we have to overcome to produce a truly mobile system,” says Broderick.

During the mission, the UC-led team evaluated the drone’s communications capabilities by remotely operating with the new surgical robot located in a tent in the desert—testing the speed and quality of video streaming, robotic control and suturing to see how the novel system worked in these extreme conditions.

Broderick’s team will continue to refine the communication and robotic technology over the next five years before it ever
A LEGACY OF MEDICINE
BACK ROW, LEFT TO RIGHT:
William (Bill), pediatrician
Timothy (Tim), surgeon
Thomas (Tom), cardiologist
Marylynn, pediatrician
Joseph (Joe), neurologist
FRONT ROW, LEFT TO RIGHT:
James
Ann Marie
Marilyn Ann (deceased), nurse
Joseph (Jay), family practice

CARING FOR PATIENTS is in Timothy Broderick’s genes.

Not only was his father a general practitioner and his mother a nurse, his grandfather was a dentist, two uncles are doctors and two aunts are nurses. To top it off, of the seven Broderick children, five—all of whom graduated from UC’s College of Medicine—are practicing physicians. Big brother Joe is an internationally recognized neurologist and chair of UC’s neurology department. Tom is an interventional cardiologist, and MaryLynn and Bill are pediatricians. He also has five cousins who are practicing physicians in the greater Cincinnati area.

“Family brought me back to Cincinnati in 2003,” recalls the younger Broderick. “One of the best memories I have at UC is lecturing with my brother Joe at Mini Medical College. Even though we were discussing very different topics, it was great fun to share some brotherly repartee. I am really proud of him, and there isn’t anywhere else in the world we would have the chance to do that but here.”

He says it’s great having a family of physicians, but jokes that occasionally patient care can be difficult because “patients can’t figure out which ‘Dr. Broderick’ you are.”

Although his three daughters are a bit too young to decide what they want to be when they grow up, he suspects the oldest, Erin, 7, is a budding scientist and his daughter Caitlin, 3, says she wants to be a doctor and an astronaut.

When dad first joined NASA’s NEEMO 9 team, his girls were especially interested in crewmate Nicole Stott and wanted to learn more about being an astronaut. They met Stott, and it was a huge hit—in fact, the experience made Erin and Caitlin even more excited about science.

“The only thing that could have made it better for my three-year-old was if Nicole had been wearing a tiara when she climbed down from her jet,” chuckles Broderick. “After all, even though she loves science, at Caitlin’s age, princesses still rule.”
enters clinical use. Nevertheless, they are optimistic that these technologies—or something similar—will eventually save the lives and limbs of injured soldiers and patients living in remote locations with limited access to care.

“Mobility and telecommunications are two viable solutions to help us overcome geographic disparity in health care,” he adds.

Although such telemedicine research missions are often expensive and time intensive, requiring fast-paced travel and time away from home, the researchers say it’s worth it to know they have the opportunity to improve patient care worldwide.

“It’s rewarding to develop new technologies that can benefit American military personnel and also enable physicians to deliver better health care for everyone,” says Doarn, associate research professor and a member of the mission team. “New approaches, like HAPsMRT, show tremendous promise for disaster response in remote regions of the Earth, and perhaps one day, outer space.”

Projects like the High Altitude Platforms for Mobile Robotic Telesurgery wouldn’t move forward without the support and expertise of CHUCK DOARN (right) and Brett HARNETT (below). Doarn, executive director of the Center for Surgical Innovation, was intimately involved in strategic planning for NASA’s aerospace medicine and telemedicine initiatives for more than 10 years. He currently serves as editor of the Journal of Telemedicine and e-Health, the leading scientific journal dedicated to this emerging field. Harnett’s expertise is in the design, assessment, integration and implementation of the sophisticated telecommunication tools necessary to push telesurgery forward.

UC IS DEEPLY INVOLVED IN NATIONWIDE TELESURGERY RESEARCH.

Timothy Broderick, MD, whose day job is gastrointestinal surgery, recently became an aquanaut as part of the NASA EXTREME ENVIRONMENT MISSION OPERATIONS—dubbed NEEMO 9. He’s also involved in the development of the DEFENSE ADVANCED RESEARCH PROJECTS AGENCY’S TRAUMA POD, a battlefield combat casualty care system that will use a team of robots to help surgeons remotely care for injured soldiers. The unmanned pod will rove around the battlefield while physicians in a remote location use telecommunication tools to control the robots and care for the soldier.
HAPsMRT is just one project in a larger effort at UC to move surgical care into the 21st century. In June, the department of surgery unveiled a $9.5 million, state-of-the-art research and teaching center at the College of Medicine: the Center for Surgical Innovation (CSI).

(continued on page 34)
One of only a handful of centers of its kind across the nation and the only one in the Midwest, the CSI tackles unmet medical needs, such as developing minimally invasive robotic surgery and telesurgery techniques to provide care in remote areas and improve the way physicians deliver and teach medicine.

“No other place in the world has what we’ve assembled at UC,” explains Michael Nussbaum, MD, interim chair of the surgery department. “We want to become the leader in surgical innovation—in the hospital, classroom and marketplace—and we’ve brought together the technology and the team and established industry and governmental relationships critical to doing just that.”

Students and physicians gain real-time educational experiences in the lab and through distance-learning seminars delivered via Internet and streaming video. In fact, the CSI recently held a hands-on teaching symposium for more than 70 cardiothoracic surgery residents and physicians from across the United States.

Conceptually, however, the center represents something much larger.

“The CSI is the impetus for bringing health care providers together with medical industry and government leaders to push research from bench top to bedside,” says Nussbaum. “We’re addressing tomorrow’s challenges today by taking medical discoveries and
making them a reality that will improve patient care.

Although still in its infancy, the CSI already made a notable surgical breakthrough in March 2005 when Broderick performed what’s believed to be the nation’s first telesurgery from Ohio to California using the da Vinci surgical robot.

A major component of the CSI is collaboration with medical industry and government institutions. Working with the Army’s Telemedicine and Advanced Technology Research Center, the CSI helped establish the Advanced Center for Telemedicine and Surgical Innovation, a congressionally funded research effort focusing on telesurgery and remote surgical care applications for the battlefield. Timothy Broderick, MD, and Chuck Doarn are collaborating with the U.S. Department of Defense to establish the Advanced Center for Telemedicine and Surgical Innovation to further explore the implications of telesurgery to support the military.

In addition, the CSI is working with the Cleveland Clinic Foundation on the Atrial Fibrillation Innovation Center. Funded by the state of Ohio, this $22.8 million research facility focuses on minimally invasive and robotic procedures to treat atrial fibrillation.

Research partnerships with the medical industry and government institutions position the CSI—including Cincinnati—as leaders in telemedicine and strengthen UC’s role in the development of telesurgery and other advanced medical technology. These partners include Ethicon Endo-Surgery, Johnson & Johnson, Intuitive Surgical and NASA.

“We’re also helping small medical businesses shepherd their ideas into the medical marketplace,” explains Doarn. “Companies develop a preliminary device and then partner with us to fully develop, evaluate and validate its effectiveness.”

Currently, the CSI has more than $1.5 million in grant funding and expects to secure an additional $5 to 8 million in the next year.

“Solutions to complex medical problems aren’t developed in a vacuum,” adds Doarn, “so to make significant advances in medicine we have to encourage innovation and collaboration.

“The best way to do that is to bring the brightest minds together to share ideas,” he says. “That’s what we’re doing at the CSI.”
UC corrections researchers serve a real world eager for solutions to the burden of incarceration and recidivism.

By Carey Hoffman

Photographs by Dottie Stover
After 25 years at UC researching and advising the nation’s correctional systems, Ed Latessa, PhD, believes he’s just about seen it all—the good, the bad and the ugly.

How ugly? “Oh God,” Latessa laughs. “You have no idea. It’s a wonder sometimes that any offender gets fixed.”

Nothing rankles Latessa more than seeing bad ideas, like the recent fad for “boot camps” for first offenders, for example, thrown at serious correctional problems in the name of reform.

“There’s a lot of public support for rehabilitation,” says Latessa, head of UC’s criminal justice program in the College of Education, Criminal Justice, and Human Services and a leading researcher in the corrections field. “Most people want offenders to come out better than when they went in.

“Our work is not ideologically driven,” he says. “I’ve worked in some of the most conservative states in the union, and they all want what is effective.”

The reasons are self-evident.

In the early 1980s, the number of Americans entangled in the criminal justice system first reached the 2 million mark.

A little more than 20 years later, the figure hit a new milestone—it had soared to 7 million. An astounding one of every 31 Americans, on average, were either incarcerated, on parole or on probation.

And those aren’t just numbers. Masked behind every individual represented in those millions are the personal tragedies of failure, the crime victims’ intense pain and sense of violation, the disruption and feeling of loss for families involved, and the financial cost to our communities and the economy.

If all 7 million offenders continue down the same path, even after punishment, the costs could be astronomical. And the future of those tied up in the criminal justice system represents a major societal problem.

One of the nation’s best resources in combating that potential problem is the extensive body of research compiled by Latessa and his colleagues at UC, the results of which are helping to transform correctional department practices across the United States.
THOSE WHO SEEK OUT UC’S HELP, either through research grants or by contracting with the UC Corrections Institute, get the benefit of the collective wisdom contained within the institute’s own assessment tool, as well as the expertise of UC criminal justice personnel, applied to the specifics of their situations.

Corrections research and education at UC, one of the core emphases of the criminal justice department, is at a level unmatched anywhere in the country, in or outside academia. Over the last 20 years, UC researchers have worked in every state in the union, evaluating 450 programs involving some 45,000 offenders.

“That’s an incredible amount of data,” says Latessa. “No one in the world has done that much. It gives you a unique perspective.”

To get to that point, however, UC researchers first had to gain access to the field, a serious challenge considering that when they started down this path 20 years ago, any research on corrections remained on the shelf. No connection was being made between academics and practitioners, so practices in the justice system were very slow to change.

“We asked the question: How can we get information to the people working with offenders so they can do their jobs more effectively?” says Frank Cullen, PhD, a distinguished research professor on the criminal justice faculty. “We focused on how we could use the evidence of science so that they could do their jobs better. We’re at the nexus between research and practice.”

There were a lot of reasons for pessimism about whether that approach would work, says Cullen.

“Simply telling people in the field what’s wrong with the system doesn’t provide them solutions,” he says, “so our program became about transferring knowledge to people so they could intervene more effectively.”

UC has now developed its research into its own proprietary program assessment tool, the Corrections Program Checklist (CPC). The checklist takes data gathered from the 450 programs criminal justice researchers have studied and identifies in detail what prescriptive methods are most likely to work, based on the characteristics and background of each offender.

“We focused on how we could use the evidence of science so that [people working with offenders] could do their jobs better. We’re at the nexus between research and practice.”

FRANK CULLEN, PHD
The most recent additions to the database came this year with the wrap-up of a huge Ohio study—the largest of its kind—that examined outcomes for 14,500 juvenile offenders involved in several hundred programs.

In that study, UC researchers examined dozens of factors in each program and compared them with their own standards. Using a tool called the Correctional Program Assessment Inventory (CPAI), which preceded the CPC, they found that programs in the bottom 30 percent on the CPAI quality scale had 18 percent more recidivism (reoffending), compared with programs rated higher on the scale. Programs in the top 30 percent by CPAI standards had 20 percent lower recidivism than the other programs.

The evaluation process is intricate—akin to a doctor writing a treatment plan that features 20 or more variables that need to be individually factored in and addressed. “We go in looking to implement a set of principles,” Latessa says. “What we do is very prescriptive. A lot of academics go into situations like these and only know how to critique.”

Relying on “gut-level” instincts rarely works, he says. Research demonstrates that well-intended concepts such as “scared straight” programs or electronic monitoring actually slightly increase the likelihood of recidivism.

UC’s research points out that certain factors stand out in producing better outcomes in recidivism. For example, findings in the Ohio study indicate that community-based correctional facilities are a most effective choice for high-risk offenders, whereas they statistically increase the likelihood of recidivism among low-risk offenders.

That kind of specific diagnostic data is exactly what judges and administrators need if they are to sentence and assign individual offenders to programs that offer the greatest likelihood of success.

“We ended up stopping a lot of the treatment programs that were not using effective interventions,” says Mary Smith,
program coordinator with the Oklahoma Department of Corrections, one of the administrators who have frequently employed UC’s expertise.

“That was traumatic,” Smith admits, “but Ed and his staff came back to help us make sure the programs that did stick with it continue on and improve, so now we have quite a few in the ‘very satisfactory’ range—the highest on the evaluation scale. I don’t think I can even begin to describe how much we’ve changed in Oklahoma because of the work Ed has done.”

Sometimes it comes down to a very simple change making a big difference.

“We showed one group, for instance, that just a little thing like having regular staff meetings matters,” Latessa says. “And then we were able to demonstrate to them statistically how much it matters.”

UC is currently working in states from Hawaii to Maine. Colorado, Washington and Oregon, for example, have had particularly outstanding results. Ohio has made some progress, especially in programs such as halfway houses.

Halfway houses and community-based facilities benefit most from UC’s years of research, Latessa says. Prisons haven’t improved much, but not because they don’t care about programs to counter recidivism. Their major focus is always on security.

“Things have gotten better,” says Pat Van Voorhis, PhD, professor of criminal justice. “I’ve seen a 180-degree turn in receptiveness to corrections researchers.

“When I first came into the field,” she says, “criminal justice professionals didn’t want anything to do with us. Now they welcome us. It’s changed our careers—we were once office-bound scholars, and now we and our students are out there all the time.”

THE CORRECTIONS INSTITUTE, led by Pat Van Voorhis, PhD, professor of criminal justice, was funded in 2002 by a grant from the Ohio Board of Regents and is a prime example of just how much influence UC is having in the field. Now involving six faculty members, seven full-time trainers and 50 doctoral students, the institute’s influence stretches across the country. And, as more and more students graduate to leadership positions in the field, it’s creating a national network of philosophical followers who believe in the power that statistical research can have in improving corrections outcomes.
CONSIDER IT A CONFLUENCE OF POTENTIALS. At the same time America’s correctional system began a period of record growth in the 1980s, a group of academics in what was then a small criminal justice department at UC set out to find new ways to apply their research expertise to produce better correctional outcomes.

It was the right message at the right time.

The department that had only six faculty members and 115 undergraduate students when Ed Latessa, PhD, arrived as the graduate director in 1980 is now as strong as any academic criminology program in the nation. Today it has 22 faculty members, 800 undergrads, 600 master’s degree candidates, more than 50 doctoral students and the largest distance-learning program in criminal justice in the nation.

The program is big, and it is strong. Last year, it was ranked No. 3 nationally in its field by U.S. News & World Report, and it has been ranked No. 1 nationally in research productivity by the Journal of Criminal Justice.

That stature was hard-earned from a grueling mix of years of planning, grass-roots-level research in prisons and jails and millions of miles in travel by its faculty.

Helping to set the tone was Latessa, who arrived at UC a focused 26-year-old with a year of teaching experience from the University of Alabama, Birmingham. Here he found colleagues who were like-minded when it came to corrections and UC’s potential to build a powerful department.

Lawrence Travis, PhD, came with him. Frank Cullen, PhD, arrived soon after, and Pat Van Voorhis, PhD, joined in 1985, the same year Latessa became department head.

“There were only a few of us, but we were a combination...
of the right people at the right time asking similar research questions, with a strong ethic favoring rehabilitation,” says Van Voorhis. “I think we found each other’s research questions very provocative.”

The immediate question was how they, as academics, could connect with real-world corrections professionals in a way that would win their cooperation.

The point person for this was Latessa. His academic training in public administration proved valuable in both running a department and speaking the language of corrections.

Beyond that are the strengths of his personality: a self-described “kid from the south side of Youngstown, Ohio,” Latessa exudes the kind of common-man approach his origins might suggest. He can be blunt, funny—Cullen calls Latessa “the funniest man I know”—assertive and persuasive. In short, exactly the kind of voice academia needed to reach to a group of hard-bitten corrections administrators.

“He had a sense that the department and his career should not just be about what we could build within the university, but that it be a conduit to use our knowledge to improve the world,” says Cullen, who is known throughout the field for his extensive research into public attitudes toward rehabilitation.

The evidence says Latessa has been the perfect match for the mission. Despite his department head status, he is on the road constantly.

And Latessa is a guy, Van Voorhis says, who can get through to the toughest audiences. “The federal government calls him when they know they are going to have a resistant audience. Tough audiences are more likely to listen to Ed than anyone else on the speaking circuit.”

It’s been a Herculean effort to build UC’s program to that kind of acceptance. Latessa wishes more of it could be done from home.

“I’m going to Arizona tonight to speak to a group of 100 judges,” he says. “If a couple of them connect with the message, it’s worth it. I gave up long ago trying to change every system. But if I can help one little program with what I do, I feel pretty good.

“We can debate whether we’re locking up too many people. But the fact is we’re always going to have to lock up some of them, and our work can make a difference in making the system more effective. That’s what our work is about.”

“Right people at the right time asking research questions, with strong ethic favoring rehabilitation. I think we found each other’s questions very provocative.”

PAT VAN VOORHIS, PHD
Not Every Offender is the Same

That premise lies at the heart of corrections research in UC’s criminal justice division, and it’s particularly true for the fastest growing segment of offenders—women.

Very little has been done to explore differences in outcomes for women who have participated in the same programming models and practices traditionally developed for men. But, with a series of grants from the National Institute of Corrections to study the classification of women offenders, UC is on the leading edge in exploring those issues.

The study is wrapping up its third year of work in Missouri, Minnesota and Hawaii, and, says principal investigator Pat Van Voorhis, PhD, clear patterns are emerging.

“Our preliminary results,” she says, “show that women’s offenses are very heavily affected by issues like mental health, poverty, substance abuse, a lack of family and relationship support and an overwhelming single-parenting situation—issues you would associate more with mental health than a criminal profile. That’s not to say these women haven’t done some serious things, but it’s a different pattern from what we see in men.”

So far, research has involved more than 1,500 women, and additional phases are planned in California, Ohio, Indiana and Colorado. The hope is to determine paths that will help women offenders turn their lives around by linking them to appropriate social support dealing with challenges like substance abuse, employment, child support and public housing.

“Assessments currently in use don’t even talk about issues like children, family support, parenting or trauma,” Van Voorhis says. “Until recently, many were not ‘normed’ or validated for women. We’ve been flying blind when it comes to women offenders.”

Considered an authority on correctional effectiveness, Van Voorhis is lead author on the most widely used textbook on correctional rehabilitation. In addition to her gender projects, she is collaborating with UC graduate Jennifer Pealer to lead a statewide implementation of new rehabilitation programming in Georgia.
ON USING YOUR HEAD

In December 2004, The Wall Street Journal published an article about highly organized biker-lobbyists who had succeeded in weakening or eliminating lifesaving motorcycle helmet laws throughout the United States. For me, it was a call to action. In a passage that was particularly jarring, the author stated that, for varying reasons, “constituencies that might be expected to oppose the helmet-free bikers haven’t done so very aggressively, if at all.”

Members of the UC Department of Neurosurgery—part of the Neuroscience Institute—decided that we would address the issue of motorcycle helmet laws in interviews with local media and by launching our own study of patients who came to University Hospital with motorcycle injuries. If legislators and the public were confused about the value of motorcycle helmets, we thought some hard statistics would help them separate fact from fiction.

We knew we’d have plenty of patients to study. Wearing a helmet is optional for Ohio motorcyclists over age 17, and for Kentucky bikers over 20. Our findings, based on two years of research involving 224 patients at our level-1 trauma center, proved that motorcycle helmets save lives, reduce disability and save money. We even disproved one of the bikers’ most passionate arguments—that wearing a helmet increases the risk of spine injury. In fact, it does not.

Helmet laws, we found, impact more than bikers. They impact society. The average motorcyclist in our study was 40 years old. Far from being young kids, these bikers are parents and employees who are not going to be able to support their families anymore. They either die from their head injuries or they’re not able to work because they’re in rehabilitation or extended care. Society is then called upon to support not only them, but also their families. Why, we might ask, should the community be forced to pay for a biker’s personal freedom in this way?

Our statistics are carrying quite a bit of weight with the public and the media. And because no other Ohio institution is compiling this data, our figures have been especially valuable at the state level, where we are supporting efforts of the Ohio Brain Injury Association to strengthen motorcycle safety laws. Jay Johannigman, MD, associate professor of surgery and director of trauma at UC, is one of the leading advocates in this area.

Ideally we should have a universal helmet law for anyone seated on a motorcycle, just as there is a universal seatbelt law. The second-best scenario would be to require that children and passengers wear helmets and that motorcycle drivers have insurance and take a safe-driving test.

We don’t want to take away people’s freedoms, but we do want them to be safe. Thus, our days of silently treating unhelmeted bikers are over. We will speak out, and our research will help us do the talking. This is more than our job. As physicians who serve both patients and our community, we consider this our duty.

LORI SHUTTER, MD, IS AN ASSOCIATE PROFESSOR OF NEUROSURGERY AND A NEUROINTENSIVIST WITH THE NEUROSCIENCE INSTITUTE AT THE UNIVERSITY OF CINCINNATI AND UNIVERSITY HOSPITAL. SHE IS ALSO EMPLOYED BY THE MAYFIELD CLINIC.
“Close ups” are essential in research—and fortunately, pictures of the beating heart are clearer than ever. UC researchers are using a 64-slice computerized tomography (CT) scanner to see inside the body like never before. This high-speed tool captures 64 “slices” of the body in one rotation, making it possible to scan the entire chest in less than 10 seconds to produce vivid images that are invaluable to researchers and physicians alike.