UC San Diego Health Sciences

UC San Diego Health Sciences comprises one of the nation’s top research-intensive schools of medicine; the Skaggs School of Pharmacy and Pharmaceutical Sciences; the UC San Diego Health System, the region’s only academic health system; and the UCSD Medical Group of practicing physicians.

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In just four decades, UC San Diego Health Sciences has had a profound impact on health care – both locally and globally – by translating basic laboratory findings into lifesaving medical and surgical care. We are on the forefront of innovation, and 2010’s five-year, $37.2 million Clinical and Translational Science Award from the NIH places us among an elite consortium of institutions, a national network dedicated to improving biomedical research.

The grant will allow UC San Diego, with the Clinical and Translational Research Institute (CTRI) leading the way, to push ahead on new and even more imaginative paths to advance medical research. Driven primarily by UCSD Health Sciences, UC San Diego surpassed all other UC campuses in research funding in 2010 for the first time ever – testament to the amazing creativity and productivity of faculty in the School of Medicine and Skaggs School of Pharmacy and Pharmaceutical Sciences.

By 2015, UCSD Health Sciences’ combined campuses in Hillcrest and La Jolla will represent a research, clinical and educational hub like no other in the world. Plans call for the full vision of CTRI to take more tangible form with a new 292,000 square-foot building to be erected adjacent to the planned Jacobs Medical Center in La Jolla. Inside, you will read more about these new facilities, and the visionary philanthropists whose gifts have helped make them possible.

Health Sciences expansion continues with the opening of three magnificent new facilities: the Spring 2011 opening of the Sulpizio Cardiovascular Center, San Diego’s first interdisciplinary center for cardiovascular diseases; the Fall 2011 opening of our new Medical Education and Telemedicine Center, which will include the world’s most advanced center for medical education; and the planned completion of the Sanford Consortium for Regenerative Medicine building – with its unique alignment of the area’s four top stem cell research institutions under one roof – in Winter 2011.

As the only academic health system in the region, our unique and vital mission also includes educating and training the practitioners and innovators of the future. We aim to produce highly skilled, compassionate physicians and pharmacists, and to equip our graduates with the knowledge, curiosity and desire to deliver leading-edge care to their patients and to push the boundaries of medical practice through their own research endeavors.

I invite you to explore the second volume of “Discoveries” to find out more about UCSD Health Science’s transformative research: its application to improved patient care, our exciting expansion plans, global health initiatives, and the innovative new curriculum we have launched to train the researchers and physicians of the future.

Sincerely,

[Signature]
The Eloquent

“Hi Krista, how are you? Can you hear us?”

“Yes, I can hear you. Are you done?”
Popular culture promotes the myth that we only use 10 percent of our brains. While human foibles seem to support this notion, the fact is that all regions of the brain are vital. One section, in particular, rules what makes us human. This site, just behind the left ear, is the temporal lobe, or what some call the eloquent cortex. When a tumor grows uncontrollably in this area, surgery becomes an intense procedure best performed while the patient is awake.

“When removing a brain tumor, the surgical team’s ultimate goal is to destroy as much of the lesion as possible while protecting the brain’s function,” said Bob Carter, MD, PhD, professor and chief of neurosurgery at UC San Diego Health System. “To do this, we must create a unique map of the brain to determine where the paths of language and perception lie. This process requires us to test speech and motor function while the patient is awake and responding to stimuli, such as flash cards or the gentle squeeze of a hand.”

The brain, weighing less than three pounds, is an electrical organ that processes more than 70,000 thoughts per day on average. While it contains more than 100 billion neurons, it does not contain nerves that receive or transmit pain.

“Yes, I am ready.”

Krista McFadden, who was diagnosed with a growing brain lesion, is awakened from sleep.

“Hi Krista, how are you? Can you hear us?” asks Carter.

“Yes, I can hear you. Are you done?” queries Krista, initially disoriented.

“No, we’re just getting started, Krista. You’re doing great. We are going to begin some tests now. Are you ready?” asks Carter.

“Yes, I am ready,” says Krista.

First, Krista is asked to count backwards from 10 and to name the days of the week. She responds quickly and clearly. Neuropsychologist Marc Norman, PhD, sits at Krista’s side, holding one of her hands. He asks her to look at a series of images and to describe what she sees.

As Krista answers correctly, Carter and neurologist Jeffrey Gertsch, MD, create a real-time functional map of the brain’s surface. Holding a thin wand that delivers a light electric impulse, Carter touches different sections of...
Receptive speech areas are mapped by using magnetoencephalography (MEG) technology. Images show a lesion in the left temporal lobe (red arrow); blue and red areas represent auditory responses and expressive speech areas; hand motor function is localized in green.

Krista’s brain. A sudden stutter or silence indicates close proximity to a section that must be avoided. As Krista completes the tests, Gertsch reads a monitor which shows the brain’s activity. He can identify risky areas and determine whether or not the stimulation may trigger a seizure.

Operating in a Minefield

“There are some areas of the brain that no surgeon wants to operate on unless absolutely necessary. The eloquent cortex is one of them,” said Gertsch. “It’s like operating in a minefield. A tenth of a millimeter in the wrong direction can cause disability or paralysis. Fortunately, with advanced imaging, we can aggressively destroy a tumor while preserving the cells that help recall a loved one’s face or recognize a sentimental song.”

During the course of testing, Krista stutters. Carter maps this “hot spot” and knows not to touch it during surgery. Over the next two hours, he systematically removes the dangerous growth. As the tumor is removed in sections and sent to pathology, Krista converses with Gertsch. They discuss her children, Halloween and the best-flavored Girl Scout cookie.

The depth of the resection is checked for the last time against a three-dimensional image projected on a computer monitor.

“We know that we’ve gotten a good resection of this lesion anatomically, and we’ll be able to stop our operation,” said Carter. “We know this isn’t any kind of malignant or cancerous lesion, which is good news for the patient.”

Krista is now home with her husband and daughters. “She did really well,” said Carter. “I think she’s going to be fine. I really do.”
A SECOND GIFT OF LIFE

Twins Riley and Jack were born at 25 weeks, weighing just over one pound each, fragile and clinging to life. Their mom, Kimberly Kaelin, had given them the gift of life…but she had an equally precious gift in reserve for her tiny babies.

The Infant Special Care Center at UC San Diego Health System treats about 100 very low birth-weight babies each year. In the first days after their birth, babies gain up to 20 grams per kilogram of weight per day and the brain increases 5 percent in size every 48 to 72 hours. Yet, these small infants aren’t ready to suck or swallow for many weeks, and must be fed by a nasogastric tube, a tube that runs directly into their bellies. Making sure they are fed mother’s milk or donor breast milk helps assure that the babies have the best possible nutritional outcome.

An innovative program called SPIN (Supporting Premature Infant Nutrition) – created by Lisa Stellwagen, MD, and colleagues in the UCSD Department of Pediatrics’ division of neonatology – supports and educates mothers of premature infants, encouraging them to feed their babies only human milk. Not only does this milk help them grow, it helps dramatically decrease the chance of life-threatening intestinal infections.

“Creating SPIN was kind of a perfect storm,” explained Stellwagen. “The scientific evidence was finally there to make the human milk argument compelling, and having a multidisciplinary team meant that everyone in the hospital was on board. The parents have always been ready to do the best for their babies – they just needed the hospital system behind them.”

SPIN not only educates moms about the importance of their milk for the infant, but gives them the right equipment to begin the process right after birth – when the premature babies are sometimes too tiny for mom to hold. It also helps solve common problems in the coming weeks and months, right up to the time the babies can go home.

Today, the Kaelin twins are thriving. “SPIN helped me give my babies the best possible start,” said Kimberly. “The support and education I received at UC San Diego Health System was invaluable, at a time when I knew the best thing I could do for Jack and Riley was to give them my breast milk.” Two happy, healthy babies are living proof human milk is best. “I love to hear Jack’s belly laugh – especially since he didn’t make a single sound for the first six weeks of his life.”
Training physicians for the 21st century

The fast pace of medical discovery today requires physicians who are highly proficient, and highly motivated to constantly learn new skills and stay abreast of medical advances. They must deliver superb care, and have the curiosity and drive to ask questions and seek answers on behalf of their patients.

“The days of the 'solitary genius' approach in science and medicine are over,” said Jess Mandel, MD, associate dean of undergraduate medical education. “Students can’t just learn subject matter in classrooms and study carrels, take a test, and learn how to be a physician. They need to talk as much about what they don’t know as what they do know, ask questions and work with their peers to solve problems. That’s what leads to lifelong learning, and that’s what drives medicine forward.”

With a progressive new medical curriculum in place, and a new state-of-the-art Medical Education-Telemedicine Center that incorporates the newest design standards and technologies nearing completion, UC San Diego School of Medicine is reaffirming its role as an institution focused on the needs of the future, not the practices of the past.

“We aren’t content just to be among the best medical schools. We also want to be a model for how a medical school should function in the 21st century,” said David A. Brenner, MD, Vice Chancellor for Health Sciences and Dean of the School of Medicine.

A Tapestry Approach

The foundation for this innovative learning environment is the Integrated Science Curriculum (ISC), three years in development, and introduced to the entering medical school class in Fall 2010. Holistic and learner-oriented, the new curriculum focuses from the start on clinical medicine and patient interactions. Traditionally, students spent the first two years of medical school in classroom lectures learning distinct subjects like biology, chemistry, physiology and pharmacology, and only began learning to apply this knowledge to the care of patients in the clinical setting in their second two years.
The ISC rejects this compartmentalized structure. Described as a “tapestry” approach, the ISC weaves together medical science and clinical practice from the first day of class. Scientific concepts are threaded throughout courses that focus on organ systems, health and disease – giving students a solid grounding in the direct relevance of science as a foundation for clinical practice, and in the important role of genetics and molecular biology in the delivery of highly personalized care. Students begin learning medical and surgical skills well in advance of their first patient encounter, utilizing advanced simulation technologies. At the same time, they participate in the process of scientific inquiry and discovery in one of the world’s premier biomedical research institutions.

A Learning Community

To reinforce the focus of the new curriculum, from the first day, students are assigned to one of six learning communities, an affiliation they will maintain throughout medical school. Each community includes members from each year’s class, giving newcomers built-in peer mentors and colleagues who can provide support and guidance as they face the challenge of medical school, and ultimately in the development of their professional identity. In addition, each learning community will partner with a community-based health program, to give students valuable public health and service learning experience from the beginning of their education.

“In my mind, the integrated curriculum is building a clinical-centered scaffolding that will eventually help me think and problem-solve like the best diagnosticians, while never failing to emphasize the importance of patient-centered care,” said first-year medical student Darrell Tran. “We feel especially fortunate to be pioneers for both the inspiring changes in the curriculum and the state-of-the-art facilities that we’ll be utilizing next year.”

High-Tech Facility

The Medical Education-Telemedicine Building, set to open in Fall 2011, will provide the physical home where students will learn to become skilled, compassionate and innovative physicians. The facility’s Clinical Skills and Simulation Center will have 18 exam rooms, simulated hospital rooms, an intensive care unit and an emergency department. The Medical and Surgical Teaching Laboratories provide a high-tech setting where students, residents and practitioners can practice procedures on tiny blood vessels and nerves, and learn surgical, robotic and laparoscopic techniques. The Telemedicine Training and Consultation Center will be a resource for physicians and students to collaborate and provide care to patients across long distances.

The building will also foster interdisciplinary training, continuing the model of integrated classes of pharmacy and medical students, along with opportunities for additional team training with other health care professionals.

Conceived as the gateway to the medical school campus, the 99,000-square-foot Medical Education Center will be a versatile, multipurpose facility. Architecturally and technologically futuristic, it will meet the needs of students, faculty, physicians, and the community for decades to come.

“The new medical education building will not only set the stage for the integrative curriculum to truly shine, but it will also be an amazing new venue for collaborative learning and training in telemedicine,” said Tony Chen, class president of the 2014 graduating class. “These new resources will assure that, as future physicians, we will have the confidence and skills necessary to take charge of anything that the quickly changing field of medicine has in store.”
Each year, more than five million Americans are diagnosed with heart failure. For some, medical therapies such as vasodilators and beta blockers are a life saver. For others with end-stage disease, living is a minute-to-minute fight and the only option for survival is a heart transplant. Agonized families watch as their loved ones, robbed of breath, wait for one of 2,500 available donor hearts. For some, the delay is too long and the body succumbs to multiple organ failure. In California, however, there is now a new lifeline to patients: the total artificial heart.

"Most surgeons are addicted to this ability to make people so much better - we thrive on it." Jack Copeland, MD

The Total Artificial Heart replaces both native heart ventricles and the four native heart valves.
“The total artificial heart is a device that replaces both sides of the normal heart,” said Jack Copeland, MD, professor of surgery and director of cardiac transplantation and mechanical circulatory support at UC San Diego Health System. “By definition, the total artificial heart is an orthotopic device, which means it goes into your chest. The bad heart comes completely out. It is replaced by a lightweight, plastic pumping device that rapidly restores blood flow to the entire body.”

Heart failure has many causes, ranging from coronary artery disease and dilated cardiomyopathy, to infections, viruses, physical stress and toxins. These causes all lead to one common pathway of symptoms which include shortness of breath, swelling of the feet and abdomen, malnutrition and immobility.

A Failing Heart

“Advanced heart failure is a very slow and insidious way to die, where you basically suffocate as time passes,” said Copeland. “Some patients have to take small, double or triple breaths just to equal one normal breath. They cannot exercise, and become malnourished as they consume their calories just trying to breathe. Simple tasks such as walking to the bathroom are difficult, requiring two or three hours of recovery. Often, bending over to tie their shoes makes these patients light-headed and when they straighten back up, they pass out.”

For more than 30 years, Copeland has been leading the field of heart transplantation and device therapy. He performed Arizona’s first heart transplant and was the first surgeon in the world to successfully use a total artificial heart as a bridge to transplant. Copeland has performed more than 850 heart transplants and more than 100 implants of the total artificial heart.

Back to Life

“This is a good device for people who are just beginning to lose the function of their kidneys, liver, intestines, lungs and brain. The patient is at the tipping point of organ failure but the damage is not yet irreversible,” said Copeland. “The total artificial heart goes in and, in most cases, the patients can recover from metabolic disaster – provided they are not too weak or advanced in age, and they don’t have chronic disease of other organs.”

During surgery, the patient’s chest wall is opened. Medicines are used to stop the heart, allowing the team to operate while the heart isn’t beating. A heart-lung machine keeps oxygen-rich blood moving through the body. Copeland then begins the process of removing the dying heart. Both ventricles are removed, leaving the atria, or upper chambers of the heart, to connect to the device.
When everything is attached properly, the heart-lung machine is switched off and the total artificial heart starts pumping about eight quarts of blood each minute.

“All of a sudden, the organs are pinking up and working again. It all happens before your eyes, there in the operating room,” said Copeland. “It’s miraculous to see these patients rescued from death and brought back to life. Within a day, they are breathing on their own and walking down the hall. In about a week or two, they get re-nourished. They build up their strength and then, after a few months, they are eligible for a heart transplant.”

A Different Person

For patients who receive a total artificial heart and stay in the hospital, approximately 69 percent receive a heart transplant within six months. Almost all are transplanted at the one-year mark.

Copeland cautions that implanting a total artificial heart is not without risks. The two major complications which may arise are clotting or failure of the chest to heal properly.

“For me, being a heart surgeon is immediate gratification. I started out in internal medicine, but realized right away I could not radically change patients with failing hearts,” said Copeland.

“In cardiac surgery, someone who is really sick can walk through the clinic door, and two or three weeks later you can send her back out, a different person. Most surgeons are addicted to this ability to make people so much better – we thrive on it.”

Copeland says that, in the next year, Americans may begin pushing for the total artificial heart as a permanent replacement, but that more studies need to be done.

“Theoretically, there is no reason that this device could not be used as a permanent device. Legally, according to the way it is labeled and the way the FDA has approved it, the device can only be used in the United States as a temporary device. More studies need to be done before we can offer it as a permanent device,” said Copeland.
For six weeks last year, a group of UC San Diego Health Sciences pharmacy students visited medical schools in three Taiwanese cities, part of the International Advanced Practice Pharmacy Experience. They were there to learn, of course, but also to teach.

“I saw several lectures that the students gave in Taiwan, and I could not believe they were students,” said Pieter C. Dorrestein, PhD, assistant professor at UCSD Skaggs School of Pharmacy and Pharmaceutical Sciences. “In just a few weeks, they were transformed from being the student to being the teacher and educators of the U.S. health care system, pharmacy practice and policies, and of specific pharmaceutical topics, like cardiovascular medication.”

“This ability to provide coherent explanations and field questions from the audience is a remarkable skill to have,” said Dorrestein. “It will help improve their communication skills with patients, physicians and other health care professionals.”

The Taiwan exchange program began in 2008 when a delegation from the Institute of Pharmacy, China Medical University, Taiwan (CMU) visited UC San Diego. Local university leaders made reciprocal visits, and eventually, the Skaggs School of Pharmacy established partnerships with CMU, Taipei Medical University and Kaohsiung Medical University. Dorrestein, for example, currently has a PhD pharmacy candidate from CMU in his lab studying a possible anti-leukemia compound first discovered in China.

During the spring 2010 visit, fourth-year PharmD students Ed Su, Chih Hsu and classmates made numerous presentations on the school’s curriculum, and discussed professionalism training for student pharmacists. “We spoke to at least 1,500 people – both pharmacists and students,” said Su. “Our visit was the first time a lot of the Taiwanese students had a chance for face-to-face interaction with pharmacy students from the United States.”

The students interacted through small group discussions, Q&A panels, and after-hour get-togethers. “Their hospitality was very welcoming,” said Hsu, who was born in Taiwan but moved to the United States at age 12. “They took us to markets and other sites every weekend and usually every night, even after working late.”

Su explained that most Taiwanese students have “a solid understanding of therapeutic concepts, but they don’t have much in terms of patient-interaction training. When we discussed patient interaction tips in one of our presentations, the students commented that they wished it was given greater focus in their curriculum.”

Su and Hsu also noted that most pharmacists in Taiwan are preoccupied with dispensing tasks, as they have no pharmacy technicians to assist, which leaves little time to develop their role as drug information specialists. “At TMU and CMU, we saw strongly established clinical pharmacy departments but, compared to most hospitals of similar size in America, they were very small,” said Hsu. “And the sheer number of patients for which each clinical pharmacist is responsible precludes them from giving patients a lot of individualized review.”

Both students returned home with great admiration for their Taiwanese counterparts as well as a greater appreciation for the U.S. pharmacy system.
After viewing a video produced by UC San Diego Moores Cancer Center called “Be Smart, Beat Skin Cancer,” Susan Stewart encouraged her husband, Branton, to have the mole on his arm checked out. Their doctor diagnosed melanoma and, luckily, the mole was removed before the cancer could spread. Branton believes that watching the video helped to save his life. He says that he probably wouldn’t have gone to the doctor if he had not seen the video. That is in part because both Susan and Branton have both been deaf since birth.

Nearly 1 million Americans are functionally deaf. American Sign Language (ASL) is their preferred mode of communication, but there is not a word-for word translation between English and ASL. Instead, ASL is based more on a series of pictures that convey a meaning. But it is a language that, up to now, has lacked effective ways to describe health information. For example, there is no nationally recognized sign for “cancer.” Additionally, most health care providers are not able to communicate in ASL, and there are very few medical interpreters who sign.

While studying health disparities among various minority communities, Georgia Robins Sadler, BSN, MBA, PhD, outreach director at Moores Cancer Center, and her colleagues suspected this communication barrier between the Deaf community and health care providers.

“Here was an entire community with its own language, social norms, values and cultural mores, yet policy makers were paying little attention to it,” said Sadler.
In response, a Deaf community partnership evolved and received funding from the National Cancer Institute and private philanthropies. Health care providers, interpreters and Deaf individuals collaborated to create programs that translate cancer-related topics into ASL, educate interpreters in cancer care, and train physicians in the language and culture of the Deaf community.

A New Language

Recognizing that ASL interpreters often lacked the medical background to accurately convey cancer content, Sadler and her colleagues prepared a list of about 400 cancer-related words. They asked oncologists to review the words and then place them in four categories: common words like “sunscreen,” words related to diagnosis, such as “mammography,” treatment terms, and language dealing with survivorship issues.

They next conducted focus groups with members of the Deaf community who were given medical words and asked to develop signed interpretations for each. “When you are expanding a language, you can’t just make it up,” said Sadler, “You have to go to the people who will be using the language and ask for their help.”

The Deaf community also urged Sadler and investigators to create videos that did not rely upon delivery by a health professional. The solution became Q&A videos using ASL, complemented with open captioning and voice-overs which allow both Deaf and hearing people to understand the content. The videos and subsequent webinars cover various types of cancers, as well as nutrition, exercise, post-op care and survivorship. These videos are posted on Moores Cancer Center’s website, where viewers are encouraged to use the video transcripts to facilitate communication with their health care provider.

cancer.ucsd.edu/deafinfo/

Sadler’s subsequent studies have demonstrated that the use of these videos can produce significant increases in cancer understanding by Deaf viewers. They can also be used in train-the-trainer programs and are available through a nationwide network of Deaf-friendly churches and Deaf community services agencies.

“No longer is cancer information lost in translation,” said Sadler, who has been working with the Deaf community since the mid 1990s.

Under her direction, the partners have also trained a core group of medical students in ASL, who they hope will continue to serve as champions for the Deaf community in their future careers. “Through our outreach and research, we hope to reach the tipping point within the next 10 years and positively transform the health care experience of members of the Deaf community,” Sadler added.
TURNING A BLIND EYE

For decades, scientists have marveled at the regenerative powers of fish, frogs, salamanders and newts, all capable of regrowing damaged or lost fins and limbs, hearts, eyes and spinal cords.

Even embryonic chicks possess some rudimentary powers of self-renewal. Higher-order vertebrates, on the other hand, can make no similar claim. Whatever their regenerative prowess might once have been, they have been lost in the mists of evolution. Mammalian tissues and organs, once gone, were gone forever.

But new research by Kang Zhang, MD, PhD, professor of ophthalmology at UC San Diego Shiley Eye Center, suggests all is not lost.

Zhang, along with colleagues at institutions both in the United States and abroad, has developed a potential approach for restoring human vision eradicated by diseases like retinitis pigmentosa and macular degeneration.

“If it’s successful, there is no reason to think the approach could not provide a template for tissue regeneration of other organs, such as the liver or lungs,” said Zhang, who is also director of the UCSD Institute for Genomic Medicine. “The idea is paradigm-changing. We might be able to completely alter the way we do research or think about regeneration.”
Zhang’s team has already begun that mental shift, publishing details of a proof-of-principle project that successfully converted a small number of Muller cells in mice into retinal neurons using chemical compounds. The work helped earn Zhang and colleagues a five-year, $4.66 million National Institutes of Health Transformative Award in 2010 to continue their studies.

Muller cells are a type of glia or non-neuronal support cell. In the mouse eye (and in humans), they provide architectural support for the retina. The scientists were able to reprogram the mouse Muller cells to revert back to multipotent stem cells, then to de-differentiate into photoreceptors – the light-sensing vision cells that are destroyed in diseases like age-related macular degeneration (AMD).

A Visible Difference

AMD is the leading cause of blindness in Americans age 60 and older. The affliction progressively kills cells in the macula, the part of the retina that perceives fine detail and allows us to successfully do tasks like reading and driving. AMD affects roughly 10 million Americans. Current treatments are expensive – as much as $20,000 per year – and only slow the rate of vision loss. They do not restore it.

Zhang is optimistic about his chances for success, in part because retinal regrowth doesn’t have to be 100 percent to make a visible difference.

“This isn’t like growing a new heart where you would need to create an entire organ, with millions of cells working together synchronistically. In this case, we need to regenerate only a few thousand cells to produce a measured, beneficial effect, because the human visual system amplifies everything.”

Simulating Regeneration

The new work involves screening more than 100,000 chemicals to find compounds that stimulate human Muller cells to transform themselves into photoreceptors. Ultimately, the goal is to produce a treatment that turns on regeneration with something as simple as eye drops. Zhang and colleagues are also making inroads against another vision scourge – retinitis pigmentosa (RP), an inherited, degenerative disorder in which cellular abnormalities in the retina accumulate and eventually result in blindness. RP is relatively rare, affecting approximately 1 in 4,000 people in the United States, but is currently incurable.

In some RP cases, a specific mutant gene leads to the death of photoreceptors and vision loss. An international team of scientists, led by Zhang, has developed a gene therapy in which a healthy version of the gene is introduced into the retina via a viral vector. In early studies using a rodent model of RP, the new gene restores vision.

“If it’s successful, there is no reason to think the approach could not provide a template for tissue regeneration of other organs, such as the liver or lungs.”
Kang Zhang, MD, PhD
A CONTINENTAL SHIFT

Encompassing more than 308,000 square miles or about twice the size of California, the southeastern African country of Mozambique is home to more than 22 million people and 800 doctors, only 500 of which actively practice medicine. Not surprisingly, good health care is a rare and exceedingly precious commodity.

Life expectancy at birth in Mozambique is just 42 years – 220th out of 223 countries in the world. Infectious diseases like malaria, tuberculosis and HIV/AIDS run rampant. Malaria results in more than one-quarter of hospital deaths in the country, while TB and HIV/AIDS account for nearly 60 percent of admissions at the Maputo Central Hospital, the country’s primary teaching hospital.

But an ambitious partnership between Mozambican medical officials and doctors and scientists at UCSD School of Medicine hopes to change that reality by creating a modern, expansive medical education system in Mozambique that will produce new, larger generations of locally trained doctors and health care leaders.

“This is an experiment in medical education,” said Robert T. Schooley, MD, professor of medicine and chief of UCSD’s Division of Infectious Diseases. “I’m hopeful this will become a model for other kinds of aid.”

Schooley is the chief driver behind a five-year, $12.5 million grant to enhance the capacity of Mozambique’s flagship medical school, the Universidade Eduardo Mondlane (UEM), which currently
graduates fewer than 25 physicians a year. The grant is part of a larger $130 million effort funded by the U.S. National Institutes of Health and federal government to help sub-Saharan African countries directly address and resolve some of their massive, chronic health issues.

A Healthy Relationship

The collaboration between UEM and UC San Diego extends and deepens an already existing relationship, one in which the institutions have shared expertise and personnel over the past four years through the UCSD Internal Medicine Residency Program’s Global Medicine elective. The new, larger medical education project focuses on four specific goals.

The first aim of the project is to expand bilateral research involving scientists at UEM and at the UCSD School of Medicine, with an initial emphasis on communicable diseases like HIV/AIDS, TB and malaria.

The team hopes to improve research capabilities at UEM through a mentoring relationship with UCSD doctors and scientists. This will include expanding local, sustainable research, formal training in clinical and translational research, development of a laboratory to support local translational research and creating administrative capacity to conduct human clinical trials.

Technology Improves Care

Modernization of medical technologies will be key, including the use of smartphones and iPad® devices by Mozambican doctors, which will allow them to consult online medical literature and hospital laboratory data at their patient’s bedside for the first time. This ability and expertise will be provided by UCSD’s Division of Biomedical Informatics, headed by Lucila Ohno-Machado, MD, PhD.

The fourth main goal is development of the country’s two new medical schools in the cities of Nampula and Tete to improve and expand health care throughout the country, and to improve surgical care, both at UEM and in rural areas.

“Surgical conditions, especially injuries and obstetrical emergencies, are an important yet unaddressed public health problem in Mozambique,” said David C. Chang, PhD, MPH, MBA, director of outcomes research for UCSD’s Department of Surgery. “For example, the maternal mortality ratio in the country is 520 for every 100,000 live births, compared to 4 in 100,000 in most developed nations. Nearly half of births in the country have no skilled attendant present.”

Future Generations

Project leaders expect to double the number of graduating doctors in Mozambique within 10 years – and hope many will be inspired to devote their careers to medical education and teaching further generations of physicians. The doctors training today will be the specialists, medical school faculty members and government health leaders of tomorrow, said Schooley. Not just in Mozambique, but possibly beyond.

“We hope this will be a demonstration project for the rest of Africa,” he said.
Deep within the dense, green lushness of the Amazonian rainforest rises the constant drone and roar of chainsaws and trucks removing trees at a rate of up to 13,000 square miles each year, an amount roughly three times the size of San Diego County.

Amid the din is another terrifying hum: the buzz of an indigenous mosquito called *Anopheles darlingi*, the region’s primary carrier of the parasitic organism that causes malaria. Massive deforestation from logging, mining and farming, combined with shifting population demographics and ineffective vector controls, have caused malaria to resurge in the region after decades of relative dormancy and decline.
Malaria is among the world’s great scourges. More than 3 billion people, almost half of the world’s population, live in regions where malaria is endemic. Each year more than 300 million people in the world are infected and an estimated 1 million die, primarily children under the age of 5 and pregnant women.

Anopheles Darlingi

Malaria parasite attacking red blood cells

For nearly two decades, Joseph Vinetz, MD, professor of medicine and a noted tropical disease specialist, has come to this part of the world to study and to fight malaria. It is here that he directs a new Peruvian/Brazilian International Center of Excellence in Malaria Research, a multi-faceted effort funded by a seven-year, $12.5 million grant from the National Institutes of Health.

“People talk about ultimately eradicating malaria, but that’s going to be especially difficult in places like the Amazon Basin where rates of infection are rising and there are currently a lot more questions than answers,” said Vinetz.

Malaria is among the world’s great scourges. More than 3 billion people – almost half of the world’s population – live in regions where malaria is endemic. Each year more than 300 million people in the world are infected and an estimated 1 million die, primarily children under the age of 5 and pregnant women.

Malaria in the Amazon Basin

Though less severe than in places like Africa, malaria in Latin America poses its own particular challenges. For one thing, studies show that a large proportion of the local population infected with the parasite is asymptomatic, which makes under-reporting of the disease more likely and harder to study, treat and contain.

Moreover, the mosquito vector A. darlingi can’t be colonized in the lab. Scientists must study the insect’s biological cycles and the relevant disease mechanisms out in the field. Vinetz’ team is both broad-based and broadly based. It involves researchers from universities in the United States, Brazil and Peru, plus government scientists from New York State Department of Health and the U.S. Navy. They will operate from field stations located in places like Brazilian farming settlements, Peruvian suburbs and remote mining towns in the middle of nowhere.

Much of the emphasis will be upon fleshing out the biology and ecology of A. darlingi, the modes of disease transmission, clinical manifestations of the malaria and environmental factors that promote its spread and persistence.

The goal, said Vinetz, is not necessarily absolute eradication of malaria in the Amazon region, but eventual development of a vaccine that provides general protection similar to that produced by the polio vaccine.

Beyond Campus Boarders

Vinetz’s work in the Amazon represents a first, bold step on a bigger journey he envisions for himself and UC San Diego Health Sciences. “We have some of the greatest minds and labs producing some of the best biomedical research in the world at UC San Diego,” he said. “But most of them are on this campus. I’d like to see us look outward.”

To that end, Vinetz and colleagues have established a new virtual Center for Tropical Medicine and Emerging Infectious Diseases, which will promote the translation of basic biomedical research into clinical services for diseases that hit developing countries and regions hardest, from well-known villains like malaria, tuberculosis and HIV/AIDS to more neglected afflictions like roundworm, leptospirosis and brucellosis.

“I think there are synergies common to these diseases and things we can do through better, nimble collaborations,” Vinetz said. The new center will emphasize both research and education. It will offer the only international tropical medicine course west of the Mississippi, and a master’s degree program in tropical diseases and treatments.

“There’s a huge, desperate demand for doctors and faculty trained to deal with global health issues,” said Vinetz. “This center can be part of the answer.”
How to grow old well is a question long pondered by philosophers and laymen alike. In recent years, it has assumed even greater importance for an obvious reason: we’re all living longer.

In 2009, 680 million people (11 percent) of the world’s population was 60 years of age and older. By 2050, people age 60 and over are expected to number 2 billion people, or more than one-fifth of the world’s population.

“Sheer numbers are changing how we think about aging,” said Dilip Jeste, MD, Distinguished Professor of psychiatry and neurosciences, and Estelle and Edgar Levi Chair in Aging at UC San Diego School of Medicine. “A century or so ago, the average life expectancy was around 45 years, now it’s 70 or older. There are simply a lot more people living long enough for the subject of successful aging to matter.”

Jeste is among a small group of scientists who have been thinking longest and hardest on the subject. A specialist in geriatric psychiatry, Jeste is also director of the Stein Institute for Research on Aging at UC San Diego. Its 120 diverse faculty researchers strive to better understand the complexities of the aging process, various age-related diseases and what it really means to age successfully.

Defining Well-Being

Surprisingly, there’s no real consensus on the definition of successful aging, at least scientifically. In a 2006 paper, for example, Jeste and colleagues surveyed existing literature for specific definitions of the concept. They found 28 studies with 29 definitions.

Most of the research emphasized the physical: Successful aging was primarily defined by being relatively free of disease and disability, something Jeste noted “scientists can objectively measure.”

But Jeste thinks physical well-being is just part of the aging equation – and maybe not the most important part. In a 2005 study, he and colleagues asked 500 independent-living Americans, ages 60 to 98, to detail how well they were aging. Virtually all said they were growing older just fine, with an average self-rating of 8.4 on a scale of 1 to 10. Fewer than one in 10 of the respondents took special note of their physical condition. Much greater value was placed upon qualities like attitude and adaptation.

Wisdom Comes With Age

“People who think they are aging well are not necessarily the healthiest,” Jeste said, “but they almost always possess a positive, yet realistic, attitude about their lives and an ability to adapt to change. They focus on what they can control and accept what they cannot.”

“To be sure, other elements also play key roles in aging successfully,” said Jeste. An engaged social life, with friends and family and activities that challenge mind and body, is critical. “I think it’s becoming clear that subjective values like optimism and effective coping styles are at least as important as traditional measures of health and wellness, if not more so,” said Jeste.

Psychological well-being is no longer seen as a downhill slide from the glory days of youth. Rather, contemporary polls and studies depict a U-shaped curve, with the lowest point of well-being generally occurring in one’s early 50s, followed by a steady return upward in overall happiness and self-satisfaction. By the time a person is 80 years old, he or she is likely to be just as happy or happier than an 18-year-old.

“And wise enough to know it,” said Jeste.
Q: You’ve joined an exclusive group of American billionaires, people like Warren Buffett and Bill and Melinda Gates, who have agreed to pledge at least 50 percent of their wealth to philanthropic causes. You’ve already donated hundreds of millions of dollars to a variety of causes and programs. How do you make these decisions? Is there an overarching theme or motivation that connects and guides your good works?

A: We have certain areas that we’re interested in: education, general community support, helping people, cultural activities. Within these areas, we select organizations that are, first, pursuing an objective that we’re interested in, in which we have a shared mission, and second, that are run by very good people. Our final decision usually rests upon the quality of the people involved. We need to believe they can be successful and make substantial use of the funding we provide.

Their philanthropy is extraordinary. Over the years, Joan and Irwin Jacobs (who co-founded Qualcomm Inc, the San Diego-based Fortune 500 company) have given or pledged hundreds of millions of dollars in gifts, scholarships, programs and buildings, the bulk of it benefiting San Diego in general and UC San Diego in particular.

In 2010, the Jacobs pledged $75 million to the construction of the Jacobs Medical Center. It is by far their most dramatic contribution to health care. The 10-story, 490,000-square-foot facility, located adjacent to UC San Diego Health System’s Thornton Hospital in La Jolla, will contain 245 patient beds in three new hospitals: the Cancer Hospital, the Hospital for Women and Infants and the Hospital for Advanced Surgery. The center is slated to open in late 2016.

Recently, the Jacobs took time to talk about what guides their giving, how they envision the new Medical Center, their enduring relationship with UC San Diego and, of course, the meaning of discovery.
Education is a top priority. I would never have gotten to this position where I can support others if I had not benefited from a good education myself: scholarships during my undergraduate years at Cornell, fellowships during my graduate program at MIT. These greatly helped me, and I hope to do the same for others.

You also can’t have a good university without very good faculty, so very early on we became interested in providing that kind of support as well.

Finally, I can’t emphasize enough the importance of innovation. We want to support bold, new ideas, both their development and in their application.

Q: Your $75 million to help build what will be the Jacobs Medical Center is the first time you had invested so much in health care. What attracted you to the project?

A: Some of the motivation goes back to the theme of innovation.

In UC San Diego, we’re talking about a university medical school and health system that brings together very high quality faculty and doctors. These are people who are open to new ideas and new research. A big part of their mission is to advance the quality of medical care. The new center struck us as an ideal institution for helping bring translational medicine and discoveries to the bedside more quickly.

I was also very impressed with the planning that has gone into the center, with the different hospitals that will be part of it. They will have the latest equipment, the latest capabilities to support translational medicine. It will further San Diego’s reputation as a hub for innovation and advancement in medical science.

And the building’s design caught my eye. I’m a great believer that one should not erect ordinary buildings. The Center is a legacy and extremely important to our future. It should be extraordinary in every way possible.

Q: The university has come a long way in just 50 years of existence, and you and your family have been part of that journey almost from the beginning. You were an early member of the faculty. Two of your four sons attended UC San Diego. Your wife is a long-time member and advisor to many university-related foundations and programs. How to you see the future of the university going forward?

A: UC San Diego got off to a very strong start by attracting exceptional founding faculty members. There was a lot of emphasis on getting people who were both excellent teachers and excellent researchers. Also, the university has always been very open to the community, not cloistered behind walls or inward-looking. This culture of openness and encouraged collaboration helps set us apart from many places.

Looking forward, I would hope that in some sense the
future is simply an acceleration of current trends and relationships. Right now, we’re going through a difficult economic period, but in 10, 20, 50 years, I think and hope UC San Diego will be even better because it’s home to remarkable people who actively and constantly promote forward-thinking, and how best to inform and educate new generations of diverse students. That last part was, in fact, one of the original attractions of coming out here from MIT. As a state-supported school, UC San Diego has a large and varied student body, which aids and abets original thinking and achievement. The value of diversity cannot be overestimated.

Q: From 1966 to 1972, you were a professor of computer science and engineering at UC San Diego. What was that experience like? Do you miss it?

A: I enjoyed teaching very much. It was hard work: Keeping up with the materials. Doing research. Reserving time for students. But it was all very rewarding. There’s no better way to really understand a subject than to teach it.

Of course, being in business has been exciting too, and I’ve tried to combine the experiences in some ways. For example, we’ve organized and managed our companies over the years in ways that are very similar to a university. We’ve tried to emphasize and focus on innovation, on new thinking. We’ve tried to promote the ideals of inquiry and intellectual ferment. We don’t want people settling into old ways of thinking or doing things just because it’s easy.

That’s a lot like the way a university is supposed to work and teach. And because we’ve been lucky and have grown a lot over the years, we have been able to attract new, young people coming straight out of school. That’s one of the great advantages of an educational system: Every year brings a new class asking new questions. As much as we can, we try to duplicate that atmosphere in business, to keep things stirred up and interesting.

Q: The name of this magazine is Discoveries. You’ve made a few in the course of your life and career. What does the word mean to you? How do you describe the process of discovery? How much of it requires the mind of an engineer versus the inspiration of an artist?

A: Well, the first requirement I think is simply to have a very good fundamental education. You have to have that foundation, the basic theories available to you that you can apply to whatever you’re doing. Of course, innovation and discovery are about more than just using a set of taught equations. You need to develop an intuitive feel for material, which can occur only if you are truly, deeply interested and involved in the subject. Preparation is obviously important. You have to do the work. But just as important, you need to be optimistic. That can be difficult at times. There are always skeptics and doubters. It’s important to listen to them, to listen carefully in fact to anybody who might be helpful. You have to be open to new ideas or ways of approaching a challenge. And when you see or hear about a new opportunity or possibility, a better way of accomplishing something, you have to go for it, put in the effort, challenge
yourself. It’s critical to imagine the future. What will it be like? How will what I’m doing change things? That takes optimism and persistence.

And always, there’s the 4 a.m. test. That’s when you wake up in the middle of the night and ask yourself, “Does this still make sense?”

Q: If you could discover anything, in any field of endeavor or interest, what would it be?

A: One field that I’m quite interested in – and that I believe will become a major industry in San Diego – is telemedicine, the combining of clinical and research expertise with the latest in communications technologies. I think telemedicine is really coming together, and that it will have a major impact on both the quality and cost of health care in the future.

More and more medical research, it seems to me, involves engineering, specifically communications and data processing. Communications is basically enhancing signal-to-noise ratio. You get some noisy data and you want to know what’s the signal or information within it. The same thing broadly applies to just about any kind of medical research. For example, you have a biosensor attempting to take a reading or measurement. There is likely to be a lot of things that might add noise to the signal, that might make it more difficult to identify or pick out the pertinent information. So the challenge is to create processes that identify what’s noise from what doctors or scientists need to know and pay attention to. The end-result is better health care and, maybe, saved lives.

For more information, go to health.ucsd.edu/jacobs

Smart Walls Talk

Imagine a wall-sized video screen in your hospital room – a wall where you can watch television and play computer games, that provides access to medical education, monitors your vital signs, and allows you to videoconference with your doctor, or “Skype” with friends and family members anywhere in the world.

Plans for the UC San Diego Jacobs Medical Center include “smart walls” in patient rooms, so that patients can access an electronic system that integrates many information channels in one device. In addition to physiological monitoring, patients will be able to control the room shades and temperature. Instead of moving to another location for physical therapy, a “Wii”-like system can bring demonstrations of stretching and breathing exercises right to their bedside.

“Walls of knowledge” are also being developed for use in the Jacobs Medical Center’s operating rooms, giving surgical teams a consolidated hub where numerous camera angles can be viewed during a procedure and where surgeons can also consult with another expert at a remote location or reference operating room safety messages.
Lung Mapping

A ROAD TO A CURE

The roadmap of the human lungs resembles the street guide of an impossibly complex city, with nearly 1,500 miles of twisting airway stretching to the farthest reaches of the bronchi – tubes that convey air from the trachea to and from tiny air sacs of the lung called alveoli.
For more than four decades, pulmonologists have only been able to see a two-dimensional view of the trachea and main right and left bronchi, using a conventional flexible bronchoscope and fluoroscopy, or real-time x-ray. “Detecting benign or malignant lesions deep within the lungs using a traditional bronchoscope was like ‘driving blind’ and only provided a small diagnostic yield of 20 to 30 percent,” said Samir Makani, MD, assistant clinical professor of medicine in the Division of Pulmonary and Critical Care and director of interventional pulmonology with UC San Diego Health System.

Now, a dramatic new technology is allowing Makani and fellow physician David Riker, MD, to navigate these tiny airways and diagnose lung cancer in its early stages. They are able to locate and biopsy peripheral lesions on even the tiniest branches of the bronchi, using a system called Electromagnetic Navigation Bronchoscopy™ (ENB) – technology that can perhaps be best compared to a car’s GPS system.

The GPS receiver in a car measures distance and location by triangulating the travel time of radio signals from your vehicle to at least three of 24 satellites stationed above the Earth. The satellites continuously transmit time and data about their location; the GPS receiver compares the time a signal was sent to when it was received in order to pinpoint its exact location. “ENB follows this same concept, but on a patient’s body,” Makani explains. “We put three small patches on the chest, which act like satellites. The lungs are planet Earth, and the bronchoscope with the sensor at its end is your car’s GPS. Signals are sent via the sensor to the patches, providing us with a three-dimensional image location within the lung, so that we know where to ‘drive’ the bronchoscope in order to reach the lesion.”

Journey Through the Airways

After loading digitized, high-resolution CAT scan images of the chest into the ENB software, the physicians are able to generate a 3-D virtual roadmap of the patient’s lung on a laptop. They can identify a suspicious lesion as the end target and label it, along with other anatomical landmarks, on the CAT scan. The software then correlates these landmarks on its virtual map and generates an animation of the journey through the bronchial airways.

During the actual outpatient procedure, the patient lies on a board which emits a low-dose electromagnetic field. Makani or Riker insert the navigation system – consisting of an ultra-thin, steerable catheter containing a sensor probe inside an extended working channel (EWC) or flexible tube – through the bronchoscope, which is inserted through the patient’s nose or mouth.

The virtual lung anatomy is then correlated and linked to the patient’s actual lung anatomy during a real-time bronchoscopy. This allows Makani or Riker to maneuver the probe toward the designated end target – the peripheral lesion – by following the virtual roadmap on the monitor, which Makani describes as “like driving through a tunnel.”

Reaching the End Target

The next part is more like a computer game. On the computer screen, they follow the image of a green ball, representing the target lesion, as it appears inside of a circle. The closer they get to the actual target with the navigation system, the larger the green ball appears in the circle on the screen.

By constantly maneuvering the sensor, the physicians know they have reached the lesion when the green ball fills the inside of the circle.

Makani or Riker then extract the sensor, leaving the EWC in place, in order to pass through the tools necessary to perform the biopsy.

ENB non-surgical technology is revolutionizing the diagnosis of lung lesions by allowing pulmonologists to examine lesions beyond the reach of standard procedures or those deemed too risky. “With the use of ENB, the diagnostic yield of peripheral lung lesions has increased dramatically,” said Makani. “By navigating within the airways, there is less risk of puncturing the lung and causing it to collapse. We can attempt to diagnose lung cancer at an earlier stage because we can locate lesions in places that were unreachable before.”
A PROMISING FUTURE
When Steve and Lisa Altman’s son was 13, he was diagnosed with type 1 diabetes and his parents made him a promise. The Altmans pledged to do whatever possible to get him the most advanced treatments available – and one day, hopefully, a cure.

With their recent $10 million gift in support of the planned Clinical and Translational Research Institute (CTRI), the Altmans are one step closer to achieving their promise, by helping to ensure that the most comprehensive, personalized and advanced care is available right here in San Diego. This leadership gift will help to establish a dedicated building where researchers and clinicians can work side by side to address major diseases – shaping the future of UC San Diego Health Sciences and building upon its reputation as the place where discoveries are delivered.

“We know how difficult it is to see a disease change the life of one’s own child,” said Steve Altman, who is president of Qualcomm, Inc. “We are pleased that we can play a small role in helping UC San Diego Health Sciences bring together the resources needed to help cure type 1 diabetes and so many other diseases that impact our community and the world.”

The Altmans understand the profound effect a disease can have on a family. In addition to their son, now 21, three other family members have lived with type 1 diabetes since childhood. Tests have revealed their teenage daughter is likely to one day develop the disease as well.

“When my brother contracted the disease more than 30 years ago, we were led to believe then that a cure was just around the corner,” said Steve Altman. “Tremendous progress has been made, but there is still a lot of work to be done.”

The Altmans are generous patrons of many local and national charities. They host an annual charity event in San Diego called “Rock the Cure,” which raises funds to support research to find a cure for type 1 diabetes.

“It is of critical importance to us and so many other families that a cure for type 1 diabetes is found, and found soon,” said Lisa Altman.
Information technology provided by the San Diego Beacon Community Collaborative will provide a new and more effective kind of communication between health care providers.

Imagine your grandfather at home, alone. Suddenly, he’s jolted by sharp and crushing chest pain, but still manages to summon a neighbor, who calls 9-1-1. Paramedics are on the scene minutes later.

“When the Emergency Medical Service (EMS) responder asks your grandfather if he takes any medication, he can’t remember,” says James Killeen, MD, associate clinical professor in the Emergency and Hyperbaric Medicine departments and director of Information Technology Services for UC San Diego Health System’s ED. “So the responder checks the medicine cabinet and discovers 25 different medications.”

What happens next? Which medicines matter?

It’s a common scenario and maybe a major medical crisis for both the patient and the paramedic. A remedy may be on the way, thanks to an expansive project called the San Diego Beacon Community Collaborative (“Beacon”), an innovative partnership of San Diego County health care organizations that uses electronic health records (EHR) and health information exchange (HIE) programs to achieve new goals in patient care, population health and the efficiency and effectiveness of local health care systems.

With such a system, said Killeen, the paramedic or doctors “can immediately access your grandfather’s electronic health record and see that he has been to several hospitals recently, as well as identify his primary care physician and current medications. This information is critical as to how we initially treat him at the home and how the emergency department physicians will treat him later. It can be life-saving information.”

Building the Health Information Superhighway

Beacon is part of a larger, ambitious effort to build the nation’s health information technology highway. In May 2010, the SDBC was one of 17 Beacon communities in the country selected to receive $15.3 million in federal stimulus funding to bring “smarter, lower-cost health care to all Americans through the use of EHRs,” said U.S. Vice President Joe Biden. “Health information, accessed through EHRs, has the potential to prevent medical errors, increase the efficiency of care...
given, reduce unnecessary health care costs, increase administrative efficiencies, and to expand access to affordable care – leading to better health for everyone.”

The local Beacon effort is headed by Ted Chan, MD, professor of clinical medicine and medical director of the Department of Emergency Medicine at UC San Diego Health System. He is in charge of bringing together health care providers and diverse medical systems that may also be staunch competitors.

“Dr. Chan facilitated a kind of ‘social network’ among these organizations to make this project happen,” said Anupam Goel, MD, associate clinical professor in the Department of Internal Medicine. “He realized that they might be competitors every day of the year, but to participate in the Beacon project, everyone has to share. The bottom line for all of our organizations is to save patient lives.”

“EMS responders may be able to send car crash photos to trauma physicians via a smart phone, so that they can identify a patient’s potential injuries prior to arrival at the ED,” said Roger Fisher, administrative manager for Emergency Medical Services, San Diego Fire-Rescue Department. “We are the boots on the ground, the eyes and ears on the street for the physicians. By giving and receiving data, we can quickly make the appropriate treatment decisions. The sky’s the limit once we’re connected.”

Secure, Accurate Systems

Data collected by the different partners is kept in a shared, centralized repository. The HIE program will allow for patient identification, message encryption, image delivery to remote sites, and sharing of health information data between health care providers in the county. For example, data shared between inpatient and outpatient facilities will ensure that every member of a patient’s care team will have access to the most recent medication list, as well as discharge follow-up instructions. New technologies, including cellular and wireless advances, may also be used to encourage patients to interact with EHRs in managing their own health.

Beacon is in the vanguard of a statewide effort to create secure, accurate EHR systems and HIE programs that will allow California to build and strengthen its health information technology infrastructure, and ultimately exchange these capabilities with other states to improve care coordination and quality across the country. The ultimate goal is nationwide adoption of advanced health information technology by 2015.
TOP 10
IN NIH FUNDING

The UC San Diego School of Medicine is listed 9th in the nation in research funding from the National Institutes of Health.

America’s Best Graduate Schools

Our School of Medicine ranked 15th nationally among research-intensive medical schools in the 2012 edition of U.S. News & World Report, America’s Best Graduate Schools.

Among the Nation’s TOP TEACHING HOSPITALS

Thomson Reuters listed UC San Diego Medical Center as one of the nation’s top 15 major teaching hospitals in 2010.

BEST HOSPITALS in 5 Specialty Areas

The 2010 U.S. News & World Report annual “Best Hospitals” issue ranked UC San Diego Health System among the best in the nation in the five specialty areas: pulmonology, psychiatry, diabetes and endocrinology, orthopedics and geriatrics.

$25 MILLION for Bioinformatics

Researchers led by Lucila Ohno-Machado, MD, PhD, chief of the Division of Biomedical Informatics in the Department of Medicine, have received two federal grants totaling more than $25 million to develop new ways to gather, analyze, use and share vast, ever-increasing amounts of biomedical information.

EXCELLENCE IN IMAGING

Moore Cancer Center has been designated a Breast Imaging Center of Excellence by the American College of Radiology (ACR).
GOLD performance

In August, UC San Diego Health System, along with 267 hospitals nationwide, received the American Heart Association/American Stroke Association’s Get With The Guidelines® Gold Performance Achievement Award for using evidence-based guidelines to provide the best possible heart disease and stroke care to patients.

MOST WIRED

For the fifth consecutive year, UC San Diego Health System was named one of the nation’s “Most Wired” and, for the fourth time, one of the top “Most Wireless” by Hospitals and Health Networks, a publication of the American Hospital Association.

Seal of Approval

The Joint Commission (TJC) has awarded the Gold Seal of Approval for health care quality to UCSD’s Chronic Kidney Disease (CKD) Program. The program is the first chronic kidney disease program in the nation to receive this disease-specific certification.

NEW CENTER to Detect Ovarian Cancer

A generous gift from Iris and Matthew Strauss has established The Iris and Matthew Strauss Center for the Early Detection of Ovarian Cancer at Moores Cancer Center. The gift was made in memory of their daughter Stefanie, who succumbed to ovarian cancer in 2006. Stefanie spent the last months of her life advocating for early detection of this invasive disease, in hope that others would benefit and be saved by early treatment.

To learn how you can support UC San Diego Health Sciences, call (858) 822-2084 or visit healthsciencesgiving.ucsd.edu.