Discussions about U.S. health-care reform have largely focused on broadening insurance coverage. That’s unfortunate, says a Stanford researcher, because we should spend more time looking for ways to truly improve health.

In a recent New England Journal of Medicine article, Randall Stafford, MD, PhD, professor of medicine at the Stanford Prevention Research Center, said the health-care system needs to be re-engineered to help people stave off conditions like obesity and diabetes.

“Increasing health-care coverage has the potential to make the inefficiencies of the current system more visible and worsen the current financial stresses in the system,” he said. “We need to think about more fundamental changes in the way that health care is delivered.”

The current model for medical care arose 100 years ago when people didn’t live as long and infectious diseases caused large numbers of deaths. Treatments and technologies were developed to combat these diseases, and a payment structure evolved that compensated doctors for prescribing pills and procedures to treat the conditions.

Strategies for preventing disease—such as coaching patients on how to make changes to enhance their health—may be cost effective, but they can’t be made profitable, which gives researchers little incentive to explore the field.

Grow for the future

Rucks, hardhats and backhoes have been a familiar sight around Lucile Packard Children’s Hospital at Stanford for the past year, preparing the groundwork and relocating key structures, such as water lines. Now the hospital is officially on its way toward a major expansion.

Over the next few years, Packard Children’s will add 521,000 square feet of new building space and more than 3.5 acres of gardens and landscaping. The expansion will add 150 patient rooms—146 of them private—as well as specialized operating rooms, family-friendly amenities and the most advanced medical technology. The new addition is scheduled to open December 2016.

“The biggest change will be in accessibility,” said Craig Albanese, MD, the John A. and Cynthia Fry Gunn Endowed Director of Pediatric Surgical Services. “We’re adding more acute and intensive care beds and almost doubling our operating rooms. These changes will help ensure that the children and expectant mothers who need our care will not be turned away for lack of space.”

Though the original children’s hospital dates back almost 100 years, the current facility opened its doors in 1991. Since then technology has changed dramatically, as have the needs of the patients who come to Packard Children’s for care.

“The new hospital has been designed not only for our patients today but also for their needs in the future,” said Packard Children’s...
**Sound Bites**

**San Francisco Chronicle**

“All this will have a profound impact on the diagnosis of disease, on our understanding of human immunity and susceptibility to disease, and on the body’s responses to drugs. New therapies will inevitably follow.”

—Michael Snyder, PhD, professor and chair of genetics, on ENCODE, a massive genome encyclopedia. Sept. 5

**Chicago Tribune**

“All of this suggests that there's no such thing as 'safe' or 'acceptable' lead levels.”

—Eswar Krishnan, MD, assistant professor of medicine, on his study that found even relatively low levels of lead in the blood are linked to an increased risk of gout, a form of arthritis. Aug. 29

**KQED Forum**

“Short-term jail for people who are addicted just doesn’t work even if there’s treatment in the jail. It’s a chronic disorder, not an acute disorder. So it may solve the problem for the people who have to deal with the behavior, which is difficult and unpleasant, but it will not bring people to recovery.”

—Keith Humphreys, PhD, professor of psychiatry and behavioral sciences, on a proposed plan by the City of San Francisco to force chronically intoxicated people to choose between jail or mandatory treatment. Sept. 6

**The Mercury News**

“What we hope is to have a clinical trial that is both safe and can extend life. We’re working toward finding drugs that can do that.”

—Michelle Monje-Deisseroth, MD, PhD, assistant professor of neurology and neurological sciences, on trying to gain a better understanding of a deadly childhood brain cancer. Sept. 10

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**A premium on primary care**

**Focus on prevention and coordination**

In a sign of how the medical landscape is changing in response to health-care reform, Stanford Hospital & Clinics is significantly expanding its primary care services with plans to add 50 new physicians and other providers over the next three years and open several new clinics on the Peninsula.

The effort will be directed by Sang-ick Chang, MD, MPH, a long-time primary-care physician who previously served as chief medical officer for two of the Bay Area’s largest public medical centers. Chang became assistant dean for clinical affairs at Stanford University School of Medicine in August.

The move reflects a trend in health care toward enhancing primary-care services and improving how various providers—family doctors, specialists, physical therapists, social workers and home caregivers, among others—work in concert to treat, educate and prevent patients from becoming ill. This team-based approach is known as comprehensive care, and its growing popularity is related, in part, to President Obama’s landmark Affordable Care Act. Signed into law in 2010, it has encouraged a shift from more traditional fee-for-service treatment models to systems that reimburse providers for the general health of their patients, not just for procedures and individual services.

**Finding a balance**

Underlying this shift is a huge challenge: How does the nation improve its health care while stopping the explosive rise in health-care spending?

“As a society, we need to find ways to rein in rising medical costs and improve the quality of care,” said Amir Dan Rubin, president and CEO of Stanford Hospital & Clinics. “Dr. Chang has helped to advance these goals by designing and directing patient-centered, evidence-based primary-care systems that emphasize prevention and coordinated care.”

Coordinated care, a central tenet of the health-care reform effort, means that patient information and preferences are shared seamlessly among providers, as well as with patients and their families, during moves from one health-care setting to another—for example, from the cardiology clinic to the radiology lab.

“We’ve learned that you can slash morbidity and mortality rates and their attendant suffering and health costs by adhering to evidence-based treatment guidelines for all patients,” Chang said.

Evidence-based care is the practice of using the best available information from up-to-date scientific research to determine a patient’s diagnosis and treatment. “This sounds simple,” he added, “but in reality it takes a highly coordinated system that involves information systems, performance monitoring, education and communication, and a team approach to caring for patients.”

**Redesigning primary care**

Chang has devoted much of his 22-year career to redesigning primary care and health systems to better serve both patients and society. He previously served as chief medical officer of the Alameda County Medical Center, a safety-net health system, and was CEO of the county-owned San Mateo Medical Center, where he oversaw 1,400 employees.

“What attracted me to this position at Stanford was the vision of the leaders both at the hospital and medical school, and the chance to work with a world-class institution to help solve some of the most pressing problems of health care today: bending the cost curve and improving quality and the patient experience by creating evidence-based and patient-centered primary care,” he said.

To this end, the hospital and medical school are collaborating to boost the number of staff, clinics and research efforts in family medicine, internal medicine, geriatrics, palliative care and occupational health, among other primary-care services, said Mark Cullen, MD, chief of the Division of General Medical Disciplines. The aim is to make Stanford a research leader in new approaches to primary care and a recognized destination for comprehensive
Most of us have come to think that stress is bad for us, but it is really part of our fundamental survival system. Stress can be harmful and dampen the immune response if it is chronic or ongoing. But short-term stress—the “fight-or-flight” response—may actually be beneficial, according to research by Firdaus Dhabhar, PhD, associate professor of psychiatry and behavioral sciences and director of research at the Stanford Center on Stress & Health.

What are the different kinds of stress responses?

We define stress as a constellation of events that begins with a stimulus or challenge—a stressor—that is detected by the brain which activates the fight-or-flight systems in the body—the biological stress response. Acute or short-term stress results when the biological stress response is activated for minutes to hours.

Repeated short-term stress is experienced during most day-to-day living situations. Although we need to conduct more studies to better understand this, it appears that most reasonably healthy people can deal with repeated short-term stressors as long as there are sufficiently long periods when stress-related biological factors are at very low levels, such as when the person is at rest.

Chronic or long-term stress results when the biological stress response is activated for months to years. It can be due to one long-term stressor, like caring for someone who is chronically ill, or from numerous short-term stressors with insufficient time for a return to a resting state.

Tell us how there might be benefits to stress.

The overwhelming focus of science and the media has been on the bad effects of stress because it is known that stress can have significant deleterious effects on health. In general, chronic or long-term stress can have harmful effects. In contrast, acute or short-term stress can have protective and beneficial effects. We have shown that when short-term stress is coupled with immune activation—for example during surgery or vaccination—the immune response is enhanced.

In general, chronic or long-term stress can have harmful effects. In contrast, acute or short-term stress can have protective and beneficial effects. We have shown that when short-term stress is coupled with immune activation—for example during surgery or vaccination—the immune response is enhanced.

Chronic stress has been associated with increased biological aging, suppression or abnormal regulation of immune function, impairment of brain structure and function, increased susceptibility to some types of infection and worsening of conditions like depression, heart disease and some types of cancer.

However, it is important to appreciate that Mother Nature has given all living beings, including humans, resilience mechanisms so we don’t just keel over the minute we start experiencing chronic stress. In fact, psychological and biological resilience mechanisms enable us to keep functioning even when we are under chronic stress. The sad thing is that we can put ourselves under so much chronic stress that even the powerful resilience mechanisms that nature has given us can break down.

Interestingly, there are remarkable differences in stress resilience. Some individuals can continue to function normally or even well under significant amounts of chronic stress, while others are less able to do this. Another key area of research in our lab is to investigate the markers and mechanisms of resilience. Our long-term goal is to enable the development of interventions that would increase stress resilience, especially in individuals who find themselves in chronically stressful situations.

How can stress impact the development and progression of cancer?

Chronic stress has been shown to accelerate cancer progression by inhibiting protective immune responses, enhancing harmful immune responses and increasing blood vessel growth factors and proteases (enzymes that break down proteins) that enable tumors to grow and metastasize.

How might stress play a role in other medical conditions?

It appears that chronic stress can produce long-term increases in inflammation and oxidative damage, which may be ways that chronic stress can affect other medical conditions.

What are some techniques for reducing chronic stress?

The key is to prevent long-term elevation or abnormal regulation of stress-related biological factors and to maximize the time spent in the resting state. From what we know so far, it’s pretty much grandma’s advice: Sleep well, eat and exercise in moderation, and engage in activities that help you feel relaxed and rested.

It is important to find what works for you and then to do it consistently. Consistency may be more important than intensity, so a brisk walk on a frequent and regular basis for reasonable amounts of time may be more helpful than jogging as fast as you can once every few weeks. Genuine support from friends and family can also be an effective chronic stress buffer.

For more on Dhabhar’s work on stress, go to talentsearch.ted.com/video/Firdaus-Dhabhar-The-positive-effect-of-TED-Vancouver.
President and CEO Christopher Dawes. “It will incorporate the very latest medical technology while also providing more privacy and more space for families to be with their sick child or pregnant spouse.”

**Efficiency and safety**

The expansion will feature not only amenities dedicated to family needs—like private rooms, quiet waiting areas and age-appropriate playrooms—but space designed to make work more streamlined and effective, such as centralized meeting rooms, adjacent storage for medical supplies, outdoor break areas for staff and onsite locker rooms and showers.

**Expansion at a glance**

- **$21,000 additional square feet of building space**
- **3.5 acres of healing gardens and green space**
- **150 new patient rooms (146 private)**
- **Natural light and access to outdoors**
- **Seven new operating rooms**
- **Hybrid ORs that merge surgery with imaging**
- **Family Resource Center**
- **Separate elevators for visitors and services**

**Blended technologies**

The addition of seven new operating rooms will cut down on scheduling delays and wait times. Two of the ORs are specialized hybrid rooms with fully integrated, state-of-the-art diagnostic imaging equipment. Surgeons will be able to collaborate with anesthesiologists and radiologists and use rapidly updated images during procedures like repairing a malformed heart or removing a brain tumor. Patients will not need to be moved to another room for CT scans, MRIs or catheterization procedures.

“A big attraction is that these ORs are highly flexible,” said Albanese. “You can use them as a cardiovascular or neurological surgical suite or as a general operating room, with the imaging equipment available for others to use.”

Surgeons will be able to reimage a patient immediately after a procedure to ensure that the operation was successful, which shortens time in the operating room—and recovery time. Pre-op areas will provide more privacy and allow parents to stay with their kids while they are being prepped for surgery in areas designed for quiet and calm.

“Surgery for a child is a scary thing for parents, so anything we can do to minimize the stress is a great thing,” said Anita Honkanen, MD, chief of pediatric anesthesia. “The design allows us to provide seamless care because there are so many efficiencies in how the suites are laid out. The right things are in the right place, which means we will all be able to do our jobs more efficiently and safely.”

Another plus, according to Albanese, is that advanced facilities will be an enticement to recruiting top physicians, surgeons and nurses. “Technology changes the way we confer care to our patients,” he said. “It’s a reflection of our connection to an academic medical center and with Silicon Valley. These advanced facilities will bring the kind of people here who are eager to improve how we treat pediatric patients.”

**Planning process**

Mockups of the ORs and two kinds of patient rooms were constructed off-site and assessed by representatives of everyone who would use them: surgeons, radiologists, nurses and parents. More than 800 people were involved in the planning process and took part in a number of scenarios to see what worked—and what needed to be changed. Their feedback was tracked and incorporated by the hospital architects, engineers and contractors.

“No one room stayed as originally designed,” said Sullivan. “No one knows how equipment should be laid out better than the people who actually use it.”

In the ICU rooms, for example, monitors were moved overhead to allow 360-degree access to the child’s bed and bathtubs were moved for a more logical floor plan. Reading lights have been placed near the spare bed, and medical console outlets were rearranged. In the hybrid ORs, MRI magnets were repositioned, lights and screens were placed for better visibility, electrical cords were lengthened and room controls were centralized.

“The rooms have been built around the surgical procedures. In neurosurgery, in particular, patients need to be placed in

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“The right things are in the right place, which means we will all be able to do our jobs more efficiently and safely.”

—Anita Honkanen, MD, Chief of Pediatric Anesthesia
It was around Christmas last year when William Wylie-Modro and his family realized something wasn’t right. The 17-year-old high school senior had been born with a heart abnormality that left him with two chambers rather than four, and his health had begun a precipitous decline that winter. When a physician at Lucile Packard Children’s Hospital informed his family that a heart transplant was his only option, they were stunned—and utterly unprepared for the realities such a decision involved. Luckily they had someone in their corner from day one.

“Mary is just a walking angel,” said Sheron Wylie-Modro, William’s mother.

She was referring to Mary Burge, LCSW, Packard Children’s pediatric heart transplant social worker. For more than 30 years she has attended to just about every non-medical issue that comes up while preparing for and recovering from the procedure. For patients and their families, she’s something of an all-purpose fixer.

“She sorted out our insurance situation. She worked out my accommodations. She wrote a letter to my husband’s work, explaining that he needed to be away for a period,” Wylie-Modro said. “She even worked with William’s school to make sure he’d be getting credit for certain classes.”

Here she stopped not because she ran out of examples but because William started interjecting his own.

“I play a little guitar, and when she found out she arranged for the hospital’s guitarist, Jeff Buenz, to come play at my room at the hospital,” he said. “Later, she helped me apply to the Make-a-Wish Foundation, which gave me a new computer for college. And she helped me find scholarships I could apply for, too.”

Long-term connections

If Burge sounds like a miracle worker, she’s had time to hone her role. Just as Stanford’s heart transplant program is the longest continually active transplant program in the world, Burge is the longest-serving heart transplant social worker. Since starting in 1978—she first supported adult transplant patients—she has devoted herself to the array of emotional and logistical needs that accompany the procedure. Concerns start well before the transplant is scheduled and can last years after it. She’s still in touch with Elizabeth Craze, who made history in 1984 by becoming the first child under the age of 5 to receive a heart transplant at Stanford. (The first successful U.S. adult heart transplant also was performed at Stanford, in 1968.)

“This procedure requires so much maintenance afterward,” Burge said. “A surgery can be successful, but if the patient and family don’t adhere to the complicated medication regime and follow-up treatment, it won’t be a successful transplant. As transplant social workers, we’re a big part of the decision-making process in regard to the kind of treatment a patient gets. There are many factors impacting whether a patient and his or her family will cope well, or at all, with a heart transplant.”

Upon meeting a prospective patient, Burge conducts a psychological assessment to identify risk factors that could impact eligibility. She also starts answering as many questions as possible.

Invaluable resource

“So many familiar things are taken away from a patient—a sense of being in charge of your own body, your own fate, your privacy. Those can be really hard for anyone, especially kids. Right away they ask, ‘What is going on? Why am I here?’” she said. “Parents want to know everything, too. They want you to predict the future. And because so many are coming from elsewhere—another hospital, another part of the country, another country—they want to know where they’re going to stay, how they’ll manage financially, about their job, about their other kids, how they’re going to cope, and so on.”

But it’s not just the patients and their families who find Burge indispensable.

“Consistently the physician-surgeons say, ‘We couldn’t do this without her,’” said Jack Komejan, LCSW, director of social services. “She’s an amazing, calming, delightful person, with a vast repository of healing stories from her years of service. She’s truly a master of her art.”

For Burge, 71, the job is different every day and no less profound than it was on her first. “Seeing kids able to do things they couldn’t do before still makes me get teary,” she said. “They start out weak, frail, slumped over. Then, after the transplant, there’s the ventilator, the scar, the chest tubes. But then you see them shedding all those things, and sitting up straighter, and then walking and eventually going to school, riding a bike, on a skateboard, doing ballet. It’s incredible. And I can tell these stories to new families, and it’s comforting to them.”

So it was with William and his family. On May 4, in a 10-hour procedure, he received his replacement heart. Today his recovery is going extremely well. William has become a vocal advocate for organ donation and has been accepted at UC San Diego to study engineering in the fall of 2013. A month after his transplant, Burge celebrated William’s graduation from high school, held in the hospital school.

“She brought me a stick-on tie,” William said with a laugh. “It said, ‘I graduated. I accept cash.’”

“She’s an amazing, calming, delightful person, with a vast repository of healing stories from her years of service. She’s truly a master of her art.”

—Jack Komejan, LCSW, Director of Social Services
different positions, and each position requires a different room set-up,” Edwards said.

“We had a walkthrough for every position, with every member of the team: How will this work? Where will we stand? Where is the equipment? It was amazing how many details we were able to improve.”

The big picture

The hospital’s research, programs and services attract patients from around the world. Its clinical care is consistently ranked by U.S. News & World Report as among the nation’s best. State-of-the-art facilities will help to attract the most promising young physicians and surgeons and inspire innovation, Edwards said. And because technology continues to change every aspect of patient care, the plans are adaptable enough to accommodate new protocols and equipment as they develop.

“While the construction is under way, the hospital will make more advances in technology,” he added.

“It adds up to a better place to work, which of course reflects back to our patients and families,” said Albanese.

For more information, please visit growing.lpch.org.
Calling the shots
Medical students apply vaccination skills

Stanford medical student Rishi Mediratta vividly remembers the first time he gave someone a flu shot. “It was with a third-year medical student, and I was very nervous about having to stick a needle in someone,” said the future physician. But thanks to the training he received as part of the school’s student-run influenza-prevention program, “My first patient didn’t even feel the needle.”

Now more than a year later, Mediratta is co-director, along with fellow second-year medical student Rachel Rizal, of Flu Crew. Officially called the Medical Student Influenza Prevention Program, Flu Crew delivers no-cost vaccinations to people at Stanford and in the local community to reduce the burden of influenza and improve public health. It is the largest medical school program of its kind in the country.

Making an impact
Flu Crew began in 2001, when Walter Newman, MD, a family physician and adjunct associate professor, taught several first-year Stanford medical students how to give flu shots. Since then, more than 25,000 no- or low-cost vaccinations have been administered by student volunteers.

Flu Crew participation is practically a rite of passage for incoming medical students these days: 75 percent of first-year students in 2010 and 60 percent in 2011 took part in the program. At the beginning of the school year, students are taught about the pathophysiology and epidemiology of the influenza virus, which is associated with 3,000 to 49,000 deaths annually, according to the Centers for Disease Control and Prevention. Students are also given hands-on training on administering vaccines.

Last year, with vaccines and supplies donated by Vaden Health Center, Stanford University Occupational Health Center and the Santa Clara County Public Health Department, as well as support from numerous Stanford faculty and physicians, Flu Crew volunteers vaccinated more than 4,000 people, including more than 1,000 on the Stanford campus. The students have brought their services to churches, homeless shelters and free clinics; in 2010, they offered free or low-cost vaccines to voters at two polling stations in Palo Alto and San Jose.

Personal touch
“What makes our program unique is that we deliver health care to where people eat, live and work.”
—Rachel Rizal

“The programs all have a similar goal of protecting a population,” said Mediratta, noting that 42 percent of vaccines administered in 2011 were provided to low-income individuals in Santa Clara County.

Faculty advisor Pat Fast, MD, PhD, an adjunct associate professor, counts the group’s work with this population among its greatest achievements. “Last year, we vaccinated several hundred homeless individuals, a group that is at very high risk of complications from influenza, and a particular high point was immunizing women and their children at the battered women’s shelter in San Jose,” said Fast, who is also chief medical officer for the International AIDS Vaccine Initiative. “I’m sure this spares serious illness, possibly death, and also minimizes public expenditures for care.”

Hands-on training
Aside from providing an important service to the community, the program helps participating medical students by giving them early clinical exposure. First-year students don’t always have the opportunity to work directly with patients, but Flu Crew allows them to practice how to greet, treat and even thank patients.

“You’re learning to build rapport with a patient,” said Rizal. “It’s a good position to be in as a first-year medical student.”

As for the future, Flu Crew is thinking big—with a goal of providing 6,000 vaccinations in the community this fall. The program is now partnering with Khan Academy, a nonprofit that offers free educational materials, in developing an online training module. Training documents and instructions were recently shared with the University of California, San Francisco, which now has a similar program. Flu Crew also is integrated into Stanford’s medical school curriculum, ensuring that all future students are trained in vaccination.

For more information about the program, including vaccination events, go to flu.stanford.edu. You can also send questions to rachel.e.rizal@gmail.com or rishi.mediratta@gmail.com.
A sister’s life-saving gift

Judith Lattin’s life had become a very dark landscape. What she thought was a simple case of stress-induced intestinal trouble in her 20s had been the beginning of the end of her liver. At 48, she was stunned to learn that an autoimmune disease had scarred the organ beyond recovery.

For the next nine years, Lattin fought the consequences of liver failure, enduring procedures to control a bleeding esophagus, an enlarged spleen and major vein blockages. Her life became an unpleasant regimen of medications, with uncomfortable side effects, that could not always control her condition.

For Lattin and others like her, the odds are not good. Only 6,000 cadaver livers become available each year for transplants, while 16,000 to 18,000 people remain on the list. One in seven dies before receiving a new liver. There is no equivalent of kidney dialysis or cardiac ventricular-assist devices for the liver.

“Nearly eight years into her wait, Lattin’s doctors told her that the complications of her disease made a transplant problematic and they thought she wouldn’t survive the procedure. But they gave her an option: Stanford Hospital & Clinics, one of the few centers in the United States where doctors perform liver transplants from living donors. Its highly experienced team of liver transplant surgeons performs three to five living donor transplants a year. The liver is the one organ in the body that responds to loss by expanding to its original volume. That restorative quality allows someone to donate as much as 60 percent of a liver without repercussions.”

But Lattin wasn’t so sure it was a good idea. “She has three children and a husband, and I just felt it was too dangerous,” she said.

But Webb, told carefully and frankly about all the possible complications, was not dissuaded. “My sister didn’t want me to be in harm’s way, but I didn’t want her to have to wait. I wanted to help her,” Webb said. One night on the phone, she told her sister, “You need to stop trying to talk me out of this. This is my reason for being alive, to give you this piece of me.” After that, Lattin said, “I just accepted that this was something that she had to do.”

Webb was put through a tough evaluation and assigned her own medical advocate to represent her interests. “It’s a challenging, difficult surgery,” said transplant division Chief Carlos Esquivel, MD, PhD. “The risk of life-threatening hemorrhage is ever present, but we do this because there aren’t enough organs to go around.”

Three senior surgeons were in the operating room that day in December: Esquivel; Waldo Concepion, MD; and C. Andrew Bonham, MD. The team used instrumentation and tools to reduce blood loss and carefully calculated just how much liver to take. Every step of the procedure was designed to protect both donor and recipient.

“We’re kind of obsessive-compulsive when it comes to managing these patients to reduce the risk of complications,” Bonham said.

Lattin left the hospital several days after the transplant and now carefully follows rules for her medication, diet and exercise. “I have energy to do things,” she said. “I just have so much more of a joy for life.”

It took three months for her sister to experience a full recovery. “There’s not a feeling in the world that is better than when doctors come to you and say, ‘You saved two people.’”

—Christine Webb