Scott Radabaugh is just 47, but he lives with the knowledge that his heart could give way at any time.

“It’s almost like having a loaded gun pointed at your chest all the time. You just never know when it’s going to go off,” he said.

Radabaugh, a single father of three, has what he calls a “sleeping giant” of a disease, a gene that makes him prone to soaring blood levels of low-density lipoprotein, known as LDL—the so-called bad cholesterol. He’s already had two major surgeries to clear arteries blocking blood flow to his brain and his heart, and he is on the lookout for signs that he will need a third.

“I have to be very cautious. I was riding my bike recently and felt a tightness in my chest. That was what it felt like the first time I had cardiac problems,” he said, remembering the panic of that moment. “It turned out to be nothing more than the beginning of a chest cold, but it’s that type of vigilance I need to have.”

An invisible disease

His condition, known as familial hypercholesterolemia (FH), is a genetic disorder in which individuals are born with high levels of LDL, which builds up in the arteries and can ultimately choke off blood flow to the heart if not treated. It’s highly prevalent in the United States, affecting more than 600,000 adults and children—or one in 500 people. It is far more common than other widely known genetic diseases, such as cystic fibrosis or breast cancer among women.

The disease is treatable, yet it is rarely diagnosed in the United States.
Families can help their teenagers recover from eating disorders, according to recent research by James Lock, MD, PhD, professor of psychiatry and behavioral sciences at Stanford University School of Medicine. That finding changes years of thinking about how to address anorexia nervosa, bulimia nervosa and related diagnoses. Lock is psychiatric director of the Comprehensive Eating Disorders Program at Lucile Packard Children’s Hospital Stanford and author of the book “Help Your Teenager Beat an Eating Disorder.”

When a teenager develops an eating disorder, the family is often taken by surprise. Which young people are most vulnerable, and what allows these diseases to sneak up on a patient and family?

Eating disorders can happen to anyone. Adolescents who focus on their weight and shape are at highest risk. Some activities where appearance or weight is important also increase the risk, such as modeling, gymnastics, ballet, wrestling and rowing. Families can miss the early signs of eating disorders because increased worries about appearance are common in adolescents, who often keep their thoughts to themselves.

What are the warning signs of an eating disorder, and what should parents do if they see these signs in their child?

Warning signs include changes in eating patterns, skipping meals, increased driven exercise or discussion about weight, avoidance of desirable but calorically dense foods, refusing to eat with the family, vomiting, large amounts of food missing from the refrigerator and increased irritability and emotionality. If a parent sees these signs, it would be a good idea to make an appointment for an evaluation and consultation.

Why is it important to break the cycle of abnormal thinking that accompanies eating disorders?

The brain requires a large amount of energy to function well. Not eating sufficiently for a long enough period changes the structural features of the brain and can lead to confusion, slowed thinking and emotional instability. When weight is restored, many of the structural changes appear to resolve.

It’s important to break the cycle of abnormal thinking associated with eating disorders because this continued pattern of thinking increases the risk for these disorders. Changing behaviors is an important first step in overcoming eating disorders. Changing thinking takes more time but is necessary to decrease risk of recurrence.

For decades, experts thought that parents should be excluded from treating their teenager’s eating disorder. Why has that thinking changed?

For most of the early 20th century, parents were erroneously blamed for mental illnesses in their offspring: So-called refrigerator mothers (those lacking warmth) caused autism, and overcontrolling parents caused anorexia nervosa, experts claimed. These ideas about causation are without foundation.

Research at Stanford and elsewhere has shown that parents can play a big role in helping their teens recover from eating disorders. For example, we have demonstrated that a specific family-based therapy is twice as effective as individual psychotherapy for treating anorexia nervosa.

When families are involved in their child’s eating-disorder treatment, what are they actually doing and how do they learn what to do?

Families should be involved in the care of their children with any illness, including eating disorders. The odd thing was leaving parents out in the first place. We suspect that family-based therapies help by enabling the patient to learn healthy eating patterns in the context of real life instead of in a hospital environment.

The Comprehensive Eating Disorders Program helps parents learn how to prevent eating-disordered behaviors and promote normalized eating in a supportive and loving fashion. Because the behaviors and thinking associated with eating disorders are often not well understood by parents, our team of professionals helps parents by providing information, support and guidance in deciding how to best help their child.

Are there situations in which family-based treatments are not appropriate?

When parents do not want to do family-based treatment, are too psychologically or medically compromised, or where there is evidence of abuse, family-based treatment is not the right choice. Cognitive behavioral treatment for bulimia nervosa and binge eating disorder is a helpful alternative. For anorexia nervosa, individual therapy can be helpful but is much slower and less likely to lead to recovery than a family-based approach.
Physicians, staff, parents and donors mingled at the construction site of Lucile Packard Children’s Hospital Stanford January 14 to celebrate its topping off—a ceremony to mark the completion of the structural phase of its new facility and to observe an important milestone in the construction of the $1.2 billion project.

The 30-foot-long, 6,000-pound steel beam had been painted white and placed adjacent to the construction site a week earlier so that physicians, staff, visitors and construction crew members could sign their names and express their sentiments. During the ceremony, the beam was hoisted to the roof of the hospital’s south tower and bolted into place, along with an American flag and a redwood tree that will be planted later in one of the new hospital gardens.

In March, the new Stanford Hospital will place a similar steel beam by its main entrance for patients, visitors and staff to sign. It will hold its topping-off ceremony adjacent to the work site and place the beam atop its eight-story tower. A small tree and a flag will be strapped to the steel bar as it is lifted into place.

A topping-off ceremony is a long-standing tradition in construction that occurs when the highest piece of steel is placed on the building’s frame. Its origins trace back to the Vikings, who would place an evergreen tree on the top of a building for good luck. Known as kranseleg in Norway, wiesca in Poland and pannenbier in Holland, the tradition has been common in Europe since the 1400s.

“It’s a significant milestone for the project,” said Michael Lane, vice president of Phase II design and construction for Lucile Packard Children’s Hospital Stanford. “The topping-off beam is a symbol that the steel frame is essentially finished. Next will come the rest of the floors and the exterior skin of the building.”

The beam will be visible for about four months while crews complete the welding, build the metal decks and concrete floors and fireproof the entire framework. After that, the prefabricated external components will arrive, and the tower cranes will lift the building’s precast concrete shell and weatherproofing into place. By fall, the children’s hospital will look more like a building than a construction site, Lane said.

“As we approach the halfway mark of construction, the ceremony is an opportunity to recognize the time between the groundbreaking and the grand opening,” said Kevin Curran, director of construction at Stanford Health Care. “In the case of the new Stanford Hospital building, there was a lot of digging down before we started building up.”

By the time the Stanford Hospital topping off takes place, more than 200,000 cubic yards of dirt will have been removed from the site and 36 million pounds of steel will have been installed, he said.

Scheduled to open to patients in early 2018, the new 824,000-square-foot adult hospital will increase patient capacity to 600 beds, all of which will be in private rooms. The new hospital will feature an enlarged Level I trauma center and an emergency department more than twice the size of the current one. Its groundbreaking was held on May 1, 2014.

Lucile Packard Children’s Hospital Stanford broke ground on its long-planned expansion and new main building in September 2012, and the project remains on schedule to open in 2017. It will add 521,000 square feet to the approximately 300,000-square-foot existing hospital, streamlining diagnosis and treatment with state-of-the-art operating rooms and specialized equipment that caters to the unique health-care needs of children, pregnant women and their families. The expanded space will allow for the creation of 149 new rooms and the most technologically advanced children’s hospital in the United States.

More than 7,900 tons of steel will support the children’s hospital once it is completed, said Lane.

“There’s no building more complicated to construct than a hospital, especially in California,” Curran said. “The construction quality standards are extraordinarily high because the building not only has to be safe—it has to be up and running after an earthquake.”

Learn more about the Stanford University Medical Center Renewal Project at SUMCRenewal.org.
According to studies, less than 10 percent of those thought to have the disease have been identified. Cardiologist Joshua Knowles, MD, PhD, an FH expert at Stanford Medicine, says it’s a condition that has been seriously neglected in this country—under-reported, under-treated and under-researched. Sadly, he said, many people don’t learn of their FH status until they have a heart attack.

“It’s an invisible disease,” Knowles said. “If you don’t have your cholesterol checked and get treatment, you’re a ticking time bomb until something happens.”

FH is often the cause of premature heart attacks in young people, including athletes who seemingly out of the blue drop dead on the field. The disease is an underlying cause for some 24,000 heart attacks each year among people under age 60 in the United States, he said. It often affects multiple family members, as children have a 50 percent chance of inheriting it from their parents. In rare instances, children inherit two copies of the gene—one from each parent—making them unusually vulnerable, at risk for heart attack in childhood.

High levels, high risk
Radabaugh said that because of his family history, he long suspected he was prone to high cholesterol. When he was 27, he decided he should be checked out. When his cholesterol results came back, his doctor was alarmed, as his LDL level was high, nearly 300 milligrams per deciliter (mg/dl). The American Heart Association defines LDL levels of below 100 mg/dl as ideal; people with FH commonly have levels of 200 to 400. He was prescribed cholesterol-lowering statin drugs—the mainstay of FH treatment—and advised to watch his intake of fat and to exercise.

One day in 2010, while he was pedaling on the elliptical machine at the gym, he felt a burning sensation in his chest. He stepped off the machine, and the pain subsided. But he was terrified. The next morning he failed a stress test, and an angiogram (an X-ray of the arteries) showed blockages in four major vessels, including one directly leading to the heart. He was stunned to hear that he needed immediate bypass surgery.

“My surgeon said, ‘You were really lucky. You would have had a heart attack in two to three weeks, and where the blockage was located, it would have been fatal,’” recalled Radabaugh, who was just 43 at the time. He did not realize that he was an FH carrier and had been building up stores of cholesterol since birth.

“If you’re a normal person, you begin worrying about heart disease when you’re in your 60s or 70s,” Knowles said, “but if you’re an FH patient, the heart attacks start happening in your 30s and 40s.”

Spreading the word
Given Radabaugh’s family history, his doctor suggested that he have his three children tested as well, though they were just 5, 8 and 12 at the time. Astonishingly, all three children had high LDL numbers and were prescribed statins. For the first time, Radabaugh heard the term familial hypercholesterolemia. “At least I had a name for this monster I was fighting. I felt empowered,” he said. He has since become an advocate, speaking at national cardiology meetings, educating others about the condition and encouraging testing.

“If you have any possibility of high cholesterol or family history, get yourself and your family members checked,” he tells people. “Once you have the knowledge, you can do something. If you don’t, the hand of God may reach down and grab you at any moment.”

Radabaugh, who is being monitored at Stanford, was the first patient to sign up for a national registry of the nonprofit FH Foundation, which aims to identify more carriers of the three known genes that underlie the disease. Knowles, the foundation’s chief medical officer, spearheaded the launch of the online registry, which gathers information about affected individuals and their family members to help improve patient care and develop new therapies. The registry, which now has data on more than 1,500 patients, offers a rare opportunity in the world of inherited disease, said cardiologist Euan Ashley, MD, PhD.

“Here you have a very straightforward and relatively benign intervention—cholesterol testing and treatment—that can be done very early on and save lives. That is very unusual for any genetic disease. So it’s a great opportunity—if you can find people with the disease,” said Ashley, director of the Center for Inherited Cardiovascular Disease at Stanford Medicine.

The American Academy of Pediatrics also recommends that all children between the ages of 9 and 11 get a cholesterol panel, but the guideline is not widely implemented, Knowles said.

Family effort
“We need to make sure pediatricians are doing a good job of screening children for cholesterol, especially when there is a history of heart disease in the family,” Radabaugh said. “As a parent, it’s emotionally difficult to take your child for a blood draw, but after discovering FH and starting treatment, that’s the miracle. Allowing your child to have a full lifespan is what it’s all about.”

In addition to limiting fat in their diets, he and his children are religious about taking their statins—they call them their “vitamins”—and have collectively lowered their cholesterol from 1,800 to 800, he said. Studies have shown that taking statins and controlling cholesterol are highly effective in reducing mortality among FH patients to levels similar to those in the general population, Knowles said.

Radabaugh also works out daily at the gym and follows a vegan diet to help reduce his risks. He’s enrolled in a clinical trial of a new medication—one of a next generation of cholesterol-lowering drugs—and clings to the promise of new treatments that could greatly benefit him and his children.

“If I could get my LDL below 70, I may have a chance at heart disease reversal, when some of the cholesterol could come out of my arteries. I’m trying everything I can to achieve a lower cholesterol level. I want to be around another 10 years to help my kids reach their adulthood.”

For more information, visit theFHfoundation.org.
When Emily Ballenger of San Jose delivered her twins, Julia Burch and Carrie Belle, last August at Lucile Packard Children’s Hospital Stanford, she also was credited with helping train a medical student in the art of patient-centered care and relationship building.

Early in her pregnancy, Ballenger was partnered with a medical student as part of an elective course at Stanford University School of Medicine. First-year medical student Sunny Kumar attended almost all of Ballenger’s prenatal appointments and learned lessons that can come only from time spent with a real patient. “This class stands apart as a unique experience, really following a single patient over an extended period of time,” Kumar said.

The course is designed to help preclinical medical students experience pregnancy from the patient’s point of view, providing a months-long opportunity to develop a relationship with a patient that can influence the work of future physicians no matter what field of medicine they choose. The focus is on identifying with the patient’s experience rather than on their role as medical provider. The course directors are Yasser El-Sayed, MD, obstetrician in chief at Stanford Children’s Health and professor of obstetrics and maternal-fetal medicine at the School of Medicine, and Janelle Aby, MD, clinical associate professor of pediatrics.

Ballenger and her husband, James, planned to have Kumar attend their babies’ birth, as well as the first few pediatric appointments, as parents in the program often do.

With several members of her family in, or preparing for, careers in medicine, Ballenger knew how valuable an educational partnership could be for future doctors. “Before I met him, I was nervous,” she said. “But then he showed up and we talked for about 20 minutes, and it was like making a new friend.”

Ballenger was 37 weeks into her pregnancy when she developed preeclampsia and was admitted to Lucile Packard Children’s Hospital Stanford for induction. She labored for 28 hours before delivering healthy twin girls on either side of midnight, resulting in two unique birthdays. Kumar stayed with the couple through the entire labor process.

“He and James took turns talking to me and helping me through the contractions and pain, and helped me decide what interventions and pain management I wanted,” Ballenger said. “Sunny was great and knew what my wishes were going into labor because we had talked about it throughout my pregnancy. He was an amazing advocate for me and helped us figure out what we wanted to do at each step.”

Through the experience, Kumar said, he learned some valuable lessons about the importance of patient relationships. “I can say wholeheartedly that the human connection is what really drew me to medicine,” he said. “And that’s something that I will continue to value throughout my career.”

With our primary campus in Silicon Valley, we are based at the epicenter of innovation. And that innovation is defined by our patients’ needs.

While many medical schools today have similar programs, Stanford has offered the course for more than 20 years.

“I encourage my patients to participate because it’s a win for obstetric and pediatric patients,” said Susan Crowe, MD, Ballenger’s obstetrician and a clinical associate professor of obstetrics and gynecology at the School of Medicine.

“I really believe that the patient-centered care we strive for can be better achieved if we train our physicians to learn from and listen to our patients themselves. One of the biggest strengths of the program is that the patient perspective comes first. It sets the groundwork for that way of thinking in terms of training medical students,” added Crowe, who directs the Outpatient Breastfeeding Medicine Consultative Services at Stanford Children’s Health.

The extra support during pregnancy is a win for participating moms too. “I just know I have the best of care right now,” Ballenger said during her pregnancy. “I have every level of doctor looking out for me.”

Even as we work to improve health for patients locally and nationally, Stanford Medicine develops connections and collaborations across these mission areas and also across the other schools of Stanford University, propelling our care to a new level of impact. This interdisciplinary approach gives us the greatest agility to push the boundaries of discovery, mentor the next generation of leaders and deliver care that helps patients with even the most challenging conditions reach their highest health potential.

Even as we work to improve health for patients locally and nationally, Stanford Medicine’s rigorous determination to understand human biology through basic science is our most fundamental aspiration. Our curiosity-driven scientists work to unlock the deepest mysteries of the human body to discover knowledge that can improve human health worldwide.

Within our academic medical center, every clinician, scientist, educator, nurse, medical student, resident, fellow and staff member plays a role in leading and advancing this biomedical revolution—and our patients and families do, too. By participating in clinical trials, for example, patients not only receive the most advanced, state-of-the-art care but also play an indispensable role in paving the way for others to receive that care. Feedback from patients and families helps us to better understand and continuously improve the way individuals experience their care, to ensure that the most advanced care is also the most accessible, convenient and comforting.

With our primary campus in Silicon Valley, we are based at the epicenter of innovation. And that innovation is defined by our patients’ needs. And that innovation is defined by our patients’ needs.
LEARN MORE ABOUT YOUR HEALTH
Events are free unless otherwise noted. Space may be limited, so please call to register in advance.

Positive Psychology
An interactive program to explore the causes and practices of happiness in daily life
**Speaker:** Frederic Luskin, PhD
**Director, Stanford University Forgiveness Project**
**Date:** Thursday, March 5, 7 pm
**Location:** Stanford Health Library, Hoover Pavilion, Suite 201, 211 Quarry Road, Palo Alto
To register, call 650-498-7826.

Growing Healthy Babies: Nutrition Tips for Preconception, Pregnancy and Postpartum
**Speaker:** Susan Carter, MS, RD, CDE
**Date:** Wednesday, March 11, 7 pm
**Location:** Freidenrich Auditorium, Lucile Packard Children’s Hospital Stanford, 725 Welch Road, Palo Alto
Seating is limited. Register online at classes.stanfordchildrens.org.

Moving Forward After Cancer: A Personal Journey
**Speaker:** Petra Lenz Snow
**Date:** Thursday, March 19, 6:30 pm
**Location:** Stanford Health Library, Hoover Pavilion, Suite 201, 211 Quarry Road, Palo Alto
To register, call 650-498-7826.

Healthy weight program for kids
Concerned about a child’s weight? The Pediatric Weight Control Program at Lucile Packard Children’s Hospital Stanford can help. The program helps children ages 8 to 15 and their families develop lifelong healthy habits and encourages kids to change the way they see themselves. Eighty percent of children participating in the classes reach age-appropriate weights.
Enrollment is open now for classes, offered in both English and Spanish. At least one parent or guardian must participate. For more information, call 650-725-4424 or go to weightcontrol.stanfordchildrens.org.

Psychogenic Seizures
Diagnosing and treating this confusing disorder, whose attacks look like epileptic seizures
**Speaker:** Robert Fisher, MD, PhD
Maslah Saul Professor in the Department of Neurology
**Date:** Thursday, March 26, 7 pm
**Location:** Stanford Health Library, Hoover Pavilion, Suite 201, 211 Quarry Road, Palo Alto
To register, call 650-498-7826.

Preparing for Multiples
A class for those expecting twins, triplets or more
**Date:** Saturday, April 4, noon–4:30 pm
**Location:** Community Programs Classroom, 4100 Bohannon Drive, Menlo Park
**Fee:** Register online at classes.stanfordchildrens.org.

Dads of Daughters: The Joys and Challenges of Raising Teen Girls
**Speaker:** Julie Metzger, RN
Co-founder, Heart-to-Heart Program
**Date:** Wednesday, April 15, 7 pm
**Location:** Freidenrich Auditorium, Lucile Packard Children’s Hospital Stanford, 725 Welch Road, Palo Alto
**Fee:** Register online at classes.stanfordchildrens.org.

Life After Cancer: Managing Your Dental Health
**Speaker:** Catherine Draper, RDH, MS
**Date:** Thursday, April 16, 6:30 pm
**Location:** Stanford Health Library, Hoover Pavilion, Suite 201, 211 Quarry Road, Palo Alto
**Fee:** Register online at classes.stanfordchildrens.org.

Mothers of Sons: Guiding Your Son Through Adolescence
**Speaker:** Robert Lehman, MD
Co-founder, Heart-to-Heart Program
**Date:** Wednesday, April 22, 7 pm
**Location:** Freidenrich Auditorium, Lucile Packard Children’s Hospital Stanford, 725 Welch Road, Palo Alto
**Fee:** Register online at classes.stanfordchildrens.org.

Smart Sendoffs: Off-to-College Health Guidance
An interactive learning experience for high school students and their parents on how to manage health issues at college
**Speakers:** Faculty, Stanford Division of Adolescent Medicine
**Date:** Sunday, June 28, 2–5 pm
**Location:** Li Ka Shing Center for Learning and Knowledge, 291 Campus Drive, Stanford medical school campus
**Fee:** Register online at classes.stanfordchildrens.org.
here are no simple solutions when it comes to pediatric depression or, worse, teen suicide. But faculty members at Lucile Packard Children’s Hospital Stanford are reaching out to local teens and schools in a community-wide effort to help those who may be struggling with mental health issues.

“We don’t want to lose any students. We are in the business of saving and improving lives,” said Shashank V. Joshi, MD, director of the Child & Adolescent Psychiatry Residency Program at the hospital and at Stanford Children’s Health.

Following the suicides of several teens in the Bay Area between 2009 and 2011, Joshi and his colleagues began working with local educators, primary care physicians, mental health professionals and community leaders in a series of teen mental health and suicide prevention initiatives. They developed resources for students who may suffer from depression and programs to reduce the stigma associated with mental health problems.

“Mental health is part of overall health, and therefore it is our business to make sure that it is part of our focus as doctors,” said Joshi, who is also associate professor of psychiatry and behavioral sciences and, by courtesy, of pediatrics.

Working closely with school officials and community partners, Joshi helped develop Project Safety Net, designed to assist youth and adults in recognizing and responding to teen mental health concerns. The comprehensive program includes training for teachers and staff at Palo Alto’s two high schools and the development of classroom curricula for social and emotional wellness among teens, staff and parents. Hundreds of student leaders at Bay Area schools have been trained as peer educators to spread a message of hope, help and strength among their classmates, Joshi said.

“Twenty percent of all youth will experience some kind of severe distress or depression by the time of graduation, and only 20 percent seek help. There is still a lot of stigma,” he said. “You cannot prevent suicide by training only adults; you also have to train the teens. Those in severe distress may not go to an adult, but they will often tell a peer.”

Additionally, Joshi and other mental health experts at Lucile Packard Children’s Hospital Stanford played a key role in helping form the HEARD Alliance (Health Care Alliance in Response to Adolescent Depression and related conditions), a consortium of Peninsula professionals committed to identifying and responding to teen depression.

“Among the main reasons teens say they don’t seek help is that they don’t want to disclose it to anyone. There is a perception the adults don’t understand, or they won’t care or know how to help,” Joshi said.

He said several factors, such as sleep problems, severe distress about school and extracurricular performance, relationships and life transitions, may make some teens more vulnerable than others. Suicidal thoughts may progress over a period of time, with recognizable warning signs. These include:

- Hinting or talking about ways to die or attempt suicide
- Feeling hopeless and/or having extreme sadness
- Increased drug or alcohol use
- Pulling back from friends and social activities
- Severe mood swings
- Increased agitation, anxiety, irritability and aggressiveness
- Signs of self-harm, including cutting or burns

**Local Resources**

- **EMQ FamiliesFirst Services**, which can assess youth at home or school in Santa Clara County: 877-412-7474 / emqff.org
- **Lucile Packard Children’s Hospital Stanford**: 650-723-7704
- **Palo Alto Medical Foundation**: 408-730-7704 (Palo Alto) / 650-696-4666 (San Mateo)
- **El Camino Hospital ASPIRE Intensive Outpatient Programs**: 650-940-7000 (Mountain View) / 408-866-4021 (Los Gatos)
- **Trevor Project Lifeline**, specializing in crisis help for LGBTQ youth: 866-488-7386 / thetrevorproject.org
- **HEARD Alliance**, which offers many useful resources: HEARDAAlliance.org

**Tips for parents and family members**

- **Pay attention**. If your teen is talking about suicide or severe depression, be open to learning more about what he or she is going through.
- **Reach out and listen openly**. Don’t wait for your teenager to come to you with problems. Make it OK to talk about problems and feelings with you.
- **Discourage seclusion**. Encourage your teen to spend time with family and friends as well as engage in some sort of physical activity.
- **Secure items that can be used in a suicide attempt**. Remove access to firearms, medications and alcohol.
Onboard flight rescue
Nurses resuscitate heart-attack victim

Sophia Loo, RN, and Angela Bingham, RN, barely made their connecting flight to San Jose. The veteran cardiac care nurses at Stanford Health Care were on their way back from a December health-care conference in Orlando, Fla.

As they settled into their seats, Loo heard a woman a few rows ahead of her saying, “Sir, sir, are you OK?” and then, “I think this man needs help. Can someone help him?”

Loo saw a male passenger who appeared to be in real trouble. He was pale, unresponsive, sweating and breathing in a way that Loo recognized immediately. Called agonal respiration, the breathing pattern is accompanied by a snoring sound and comes in gasps, and is often a sign of imminent cardiac arrest. Bingham, seated a few rows back, had noticed the commotion and was on her way to help, when she heard Loo call out, “Angela, get up here!” Other passengers had left their seats, blocking the aisle, forcing Bingham to crawl over empty seats to get to the passenger.

Bingham and Loo had resuscitated many cardiac patients during their careers at Stanford Health Care, which is part of Stanford Medicine. “That’s part of the job,” Loo said. “But in the hospital we have the proper equipment.”

Springing into action
Both nurses knew that they had to start cardiopulmonary resuscitation (CPR) immediately. “But we couldn’t do CPR while he was in the seat,” Loo said, so she recruited three passengers to maneuver the man into the aisle. He was in his late 60s, she estimated, and weighed about 180 pounds. In the narrow aisle, there wasn’t much room.

“It was surreal,” Bingham said.

“We just went into nursing mode,” Loo said, “but the stress was beyond anything I’ve ever known as a nurse. We were so focused on what we were doing—we knew the gravity of his condition.”

Lacking a ventilating device to help deliver air through the passenger’s nose and mouth—and because he occasionally gasped and opened his eyes, which would have interfered with rescue breaths—the nurses focused on chest compressions, conducted at a rate of 100 times per minute.

A shock to the system
Flight attendants brought them the automated external defibrillator that the Federal Aviation Administration requires all commercial aircraft to carry, giving the two nurses their first chance for an objective reading of the passenger’s heart activity.

This type of defibrillator uses two adhesive-backed leads, which are placed on the skin of the chest to evaluate heart rhythm and deliver an appropriate shock. The device showed that the man’s heart was in a life-threatening rhythm and advised a shock. “I told the flight attendant to press the button to deliver the shock. We called out, ‘Everybody clear!’ and the shock did deliver,” Bingham said.

Protocol dictates that the shock be followed by three minutes of CPR. When they did a second read of the defibrillator, it instructed, “No shock.” That advice, Bingham said, arises when there is no heart activity at all. But the two nurses continued to perform CPR. At one point, the man opened his eyes, Bingham said, “so we knew something was happening, that we were getting through.”

More help arrives
Except for the sound of the CPR count, the other passengers on the plane were silent. “People were in shock, I think,” Loo said. “We lost track of time, but it was at least 15 minutes until a security person came to help us with CPR.”

Paramedics finally arrived to help, too. By the time the passenger was carried out of the plane—the aisle was too narrow for a gurney—he was conscious again, Loo said.

Loo and Bingham were rewarded with a round of applause from onlookers on the aircraft, and someone called out, “Great job!”

The nurses have not heard anything further about the man’s condition but say they hope he continues to do well.

The experience, said Loo, “reinforced why I went into nursing. I was so humbled and grateful that I could do something, that Angela and I knew what to do.”