New Organs, Renewed Lives

Roger Tricker’s emphysema was so severe that even with an oxygen concentrator, walking from his living room to the bathroom was so exhausting that he had to rest a few minutes before making the return trip. In February, the 60-year-old Santa Maria, Calif., man was put on the waiting list for a double lung transplant. Ever optimistic, he told his physician his goal was to climb Mt. Lassen, 50 miles east of Redding, Calif. “He laughed and said ‘Well, that might be a little ambitious for you,’” Tricker recalls. Now, having ascended Lassen (peak elevation: 10,457 feet) the summer after he exchanged his diseased lungs for healthy ones at UCLA, Tricker—never even much of a hiker before—is considering a climb up Mt. Shasta (14,440 feet).

Rickey Williams wasn’t even 50, and his bodily systems—kidneys, liver, digestive tract, and everything else, it seemed—were shutting down. The medications that had managed his cardiomyopathy for nearly a decade were no longer doing their job. In March, he had a left ventricular assist device implanted—a temporary solution as he awaited a working heart. It arrived just in time. Three weeks after receiving a heart transplant at UCLA, Williams was recovering rapidly and feeling great. “It’s a humbling experience that I can’t even explain,” he says. “Someone was generous enough to give me this gift, and now I have a new life. And for the doctors at UCLA, it’s become such a routinely successful procedure it’s almost like pulling a tooth.”

Obviously, solid organ transplantation remains far more complicated than a tooth extraction, with significant risks, with rejection always looming as a reality. But in the time that UCLA has built its own well-integrated team, with its own well-integrated team, with innovations in outcomes, particularly for patients in the hands of expert teams.

UCLA’s Liver Transplant Program, the world’s busiest, has seen one-year patient survival rise from below 70 percent to above 90 percent thanks in part to refined surgical techniques and the advent of better postoperative drugs to prevent rejection. When the program was started 20 years ago, two-thirds of patients experienced rejection; now, only 15 percent do. The indications have expanded: For example, one in five liver transplants at UCLA now involves a person with liver cancer. “Twenty years ago, we couldn’t cure any of these patients, and now 75 percent of them will live five years,” says Dr. Ronald Busuttil, the program’s director.

Equally dramatic results can be found in UCLA’s Heart Transplantation Program, headed by Dr. Hillel Laks. Among children, for example, the five-year survival rate after heart transplant is at 90 percent. “A significant number of our transplants are now for patients whose initial diagnosis was congenital heart disease,” says Dr. Thomas Klitzner, chief of pediatric cardiology at UCLA. “We’ve had tremendous advances in immunosuppressive therapies available to children, along with better screening tools for rejection and an improved ability to recognize which patients are good candidates for transplant and have reached a point in their condition where transplant is appropriate. It’s a giant leap forward for many patients who previously were best served by modalities such as hospice.”

Kidney transplantation was once far from routine; now, it occurs almost every day at UCLA—one of the nation’s five busiest kidney transplant centers, with approximately 300 per year performed. “Patients do so much better today,” says Anne Sanford, a transplant nurse for more than 15 years who is currently the coordinator for UCLA’s Kidney and Kidney-Pancreas Transplant programs. “There used to be just a handful of anti-rejection medications, some with devastating side effects for patients. Now, there are scores of new medications. Some are better anti-rejection drugs and some treat the infections a transplant patient may have or side effects of anti-rejection medications. Fifteen years ago, if a patient acquired a cytomegalovirus (CMV) infection, nothing much could be done and many would die a painful death. Now, patients take a pill for three weeks and they’re fine.”

UCLA has ushered in many of the advances that have improved the outcomes for solid organ transplantation so dramatically, beginning with the pioneering work of Dr. Paul Terasaki in tissue typing (see the accompanying sidebar). Among other things, UCLA has developed new surgical techniques and has participated in most of the major clinical trials for the new immunosuppression drugs that are reducing rejection risks and enhancing the quality of transplant recipients’ lives.

But at a time when every facility that performs transplants has access to the same drugs, tissue typing procedures and surgical knowledge, UCLA’s results continue to rank among the world’s best, underscoring the importance of its programs’ clinical expertise and experience.

“A large transplant program illustrates what is paradigmatic about an academic medical center: high-complexity cases; integration among basic sciences, clinical research, clinical care and education of residents and fellows; and the synergies that can occur when you bring all of these components together,” says Dr. J. Thomas Rosenthal, chief medical officer for UCLA Healthcare and a urologic surgeon who formerly headed UCLA’s Kidney Transplant Program.

Indeed, Rosenthal notes, each of UCLA’s transplant programs functions as its own well-integrated team, with...
Roger Tricker climbed Mt. Lassen the same summer he underwent a double lung transplant operation at UCLA.
experienced professionals in disciplines that include transplant surgery, medicine, interventional radiology, anesthesiology, pharmacology, nursing and social work; the basic and clinical researchers who make possible the next generation of advances; the technicians who operate the blood banks and tissue typing labs; and the coordinators who ensure that

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might interfere with the recovery regimen. After the transplant, she continues to monitor their support, finances and emotional well-being, providing or directing them to assistance where needed. Ventura also runs support groups for patients and family members, giving them an opportunity to share their unique experiences with others who are in similar circumstances.

The experience of Ventura and her colleagues who staff the transplant programs is rarely matched in other health care settings. “It’s a lot of work, often for long hours, and it can be stressful because you’re dealing with someone who has end-stage organ failure that can often lead to death,” says Nanci Flores, administrative director of UCLA’s transplant programs. “The people who staff these programs are very dedicated, and they find it extremely rewarding. It becomes almost like a calling for them.”

Transplant recipients never forget the moment they are notified that a life-changing organ awaits.

“There was a big panic,” says Tricker, smiling at the memory. “It’s like when a woman is pregnant and you make all these plans and have everything pre-packed and ready to go…then when the time comes, you forget half the stuff you were going to take with you.”

Alexander Falzon had waited four and a half years for “the call.” For three years, the retired U.S. Air Force colonel had been on peritoneal dialysis; after he nearly died of peritonitis in February 2003, he went on hemodialysis—five hours every other day connected by two needles to a machine.

A world traveler before his kidneys began to fail, Falzon hadn’t left his Santa Barbara community in six years. On December 5, 2003, just before midnight, a nurse from UCLA’s Kidney Transplant Program called to tell him a kidney had become available. Less than a year after the transplant, Falzon, 74, was making plans to visit his daughters, sister and grandchildren on the East Coast. “I’ve been reborn,” he says. “I’m making commitments in a way that I haven’t since I was 40.”

Sanford has been the bearer of news that changed lives like Falzon’s. As

the teams run efficiently and effectively. “A significant organizational effort goes into enabling a transplant program to be this big and this successful in an era of intense scrutiny,” Rosenthal says. “When you think about it, the human capability in an academic medical center to have transplant programs of this magnitude is extraordinary.”

More than most services, transplant programs screen and follow up with patients in ways that go beyond the medical aspects. Linda Ventura, licensed clinical social worker for the Heart and Lung Transplant Program, is part of a team that evaluates patients for factors such as whether they have a social support system sufficient for meeting the
manager of UCLA’s Kidney Transplant Program, she is far less likely to be the caller than in the past. But every once in a while, when her staff is extremely busy, someone will ask her to “take call.”

“There’s just nothing else like it,” Sanford says. “Patients always act like you’re the one giving them the kidney. It’s very emotional.”

In the Heart and Lung Transplant Program, the uncertainty that goes with waiting for an organ is extremely stressful, says Ventura. “The call could come at any minute or it could be months,” she notes. “Your life is on hold, you’re becoming more disabled and dependent, there are often increasing financial stresses, and of course you’re worried about dying in the event you’re not transplanted in time.”

Unfortunately, for too many patients “the call” never comes, because the demand for organs continues to far exceed the supply.

**UCLA has been a leader in efforts to close this gap.** In kidney transplantation, the living donor program has grown significantly in recent years, expanding the pool; research by Terasaki and others has shown that receiving a kidney from a living donor confers advantages regardless of the level of compatibility.

In liver transplantation, the 5,000 donors each year can’t come close to meeting the needs of the population needing an organ. For starters, Busuttil notes, an estimated 4 million people in the United States have hepatitis C; conservatively, one in five of those patients—800,000 people—needs a new liver. To address this massive shortage, UCLA’s program has developed several new strategies, including the split-liver transplant, in which an adult cadaveric liver is divided into two functioning allografts; the living donor transplant (under highly selective criteria, approximately 20 healthy donors per year give part of their liver, with an extremely high recipient success rate); and extended-criteria cadaveric donations, in which the donors are less than ideal but, through various pharmacological manipulations, quicker operating times and improved patient selection, success can be achieved.

But of a cramped UCLA office 40 years ago, an unassuming young scientist developed tissue typing techniques that would significantly advance the burgeoning field of organ transplantation. The findings established Dr. Paul Terasaki as a pioneer in one of medicine’s most remarkable 20th century advances and thrust UCLA into a leadership role that it maintains to this day.

Terasaki joined the UCLA School of Medicine faculty in 1956 and first gained international recognition eight years later when the UCLA Tissue Typing Laboratory under his leadership developed the microcytotoxicity test, which created the field of histocompatibility as it continues to be known. His technique of genetically matching donors and recipients for organ transplantation, first applied to kidneys beginning in 1964, also led to a new way to resolve disputed paternity cases and established links between human leukocyte antigen (HLA) and a variety of diseases.

In transplantation, the technique to genetically match donors and recipients—its efficacy confirmed through additional research in Terasaki’s lab demonstrating the association between the level of HLA antigen matches and graft survival—spread throughout the world. “This was a test that was relatively easy and could be standardized,” says Dr. Elaine Reed, who has inherited Terasaki’s legacy as director of UCLA’s Immunogenetics Center. “It enabled everyone to speak the same language.”

In addition to developing the microcytotoxicity test, Terasaki recognized that patients who had pre-formed antibodies against donor HLA antigens would reject the graft. All patients waiting for a kidney transplant are now screened for the presence of these antibodies.

Terasaki’s research showing better kidney graft survival rates for recipients of HLA-matched cadaveric donor kidneys changed public policy in how organs are allocated throughout the United States. The United Network for Organ Sharing now facilitates the shipment of approximately 100 kidneys per month between U.S. transplant centers for transplantation to HLA-matched recipients.

The Tissue Typing Lab also established a Kidney Transplant Registry, an international database that includes results from all kidney transplants and is used for ongoing evaluation. Among other things, the database facilitated the finding that living, unrelated donor grafts could achieve better results than cadaver grafts, even with modern immune suppression. Now, results from transplants of all organs are maintained in national registries.

The impact of these advances on UCLA’s transplant programs can be seen in many ways. Terasaki has retired, but the program he founded, now called the UCLA Immunogenetics Center and under the direction of Reed, continues to be a recognized leader in moving the field of HLA immunogenetics forward. Meanwhile, Terasaki and other early UCLA pioneers—including Dr. Willard Goodwin, then-chief of urology, who was one of the first to use immunosuppressive agents in transplant recipients—gave UCLA an international presence in the transplant field that attracted other leaders and contributed to the institution’s position as the world’s leading solid organ transplant program.
The split-liver procedure has been an especially important advance for children—particularly those in their first year of life, who, nationally, are at the highest risk of dying while waiting for an organ. “We have needed to become a lot more technically creative in terms of finding appropriate deceased donor organs for these children,” says Dr. Suzanne McDiarmid, surgeon and medical director of UCLA’s Pediatric Liver Transplant Program. With the split-liver technique, healthy cadaveric adult livers that would be too large for pediatric recipients—the majority of whom are under 2—are divided into two transplantable segments, with outcomes that are similar to those of whole-graft transplants; as a result, far fewer children on the UCLA waiting list are dying before an organ becomes available.

In heart transplantation, UCLA has played a leading role in the use of assist devices—so-called bridge therapies to keep patients alive until a heart becomes available. Recently, mechanical hearts have been developed that are appropriate for children, smaller versions that approximate normal blood flow for a child. Meanwhile, researchers are making progress in pursuit of the field’s Holy Grail—mechanical heart devices for adults and children that would serve as destination therapy rather than a bridge to transplantation.

The Holy Grail for the pancreas is islet cell transplantation. “Although pancreas transplantation is successful, it cannot fulfill all the needs for diabetic patients,” says Dr. R. Mark Ghibrial, associate professor of surgery. “Islet cell transplantation, while experimental at present, has great future promise.” UCLA and many other centers are hoping to overcome barriers that have stood in the way of long-term survival of the islet cells.

Advances in the surgical technique of lung transplantation, also pioneered at UCLA, have improved results as well as expanded the number of lungs available for transplant. Modified reperfusion, developed at UCLA by Dr. Abbas Ardehali and colleagues, combines the patient’s blood with added elements that ultimately help to resuscitate the new lungs. The process, which has been adopted by several other centers, replenishes the new lung with nutrients and removes any white blood cells that might injure the lung and cause organ failure. Ardehali, associate professor of cardiac surgery and director of the UCLA Lung Transplant Program, notes that the incidence of severe organ failure following transplantation is less than 5 percent at UCLA—significantly lower than the 10–15 percent failure rate nationally. “In the future, we’re going to see more liberal use of donor organs,” Ardehali says. “Transplant centers are becoming more comfortable with using organs that may not be perfect, given the donor shortage we face.”

Ardehali and his colleagues in all of UCLA’s transplant programs are also continuing to focus on advancing methods of immunosuppression. “We’re still using non-specific, generalized immunosuppressive medications,” he says. “With better understanding resulting from our research, we should be able to develop tools to create donor-specific tolerance, which will revolutionize the field of solid organ transplantation: It would minimize the risk of infections as the host immune system remains intact, yet control the damage to the transplanted organ and therefore might lead to increased longevity of the donor organ.”

Many people Busuttil encounters are surprised to learn about the success rates of transplantation. “The first thing a lot of people think of when they hear about transplant outcomes is that it is very high risk and that the survival rate is very low,” he says. “But the facts really are the opposite.”
of people ask me is, ‘Can you survive a liver transplant?’” he says. “They don’t realize that in fact, liver transplantation is probably the most important advance in the treatment of patients with end-stage liver disease in the history of medicine. It’s remarkable what it’s done—going from a death sentence to a relatively normal life for the 90 percent of patients who are surviving one year.”

Busuttil is himself taken aback whenever he attends a reunion party for living donors and their recipients. “What always amazes me, even after doing more than 3,000 of these, is that I can’t recognize the patients,” he says. “When we transplant them, they look so sick, and then you come back a year later and they have been completely transformed.”

The one-year patient survival in UCLA’s pediatric liver transplant program has also risen to approximately 90 percent. “These are children who are going from a 100 percent chance of death to a 90 percent chance of being alive and well with their new organ,” McDiarmid says. “And even though there are a lot of complications that can occur, if you get past the first three months, the chances are good that you will have a very high-functioning child—engaged in school and leading a normal life.”

Now that she has been performing liver transplants for 20 years, McDiarmid increasingly receives letters from former patients who are graduating from high school or college, getting married, and, in some cases, having children of their own.

Ventura notes that these and other healthy transplant recipients tend to develop a unique appreciation for life. “They always describe having a much better insight and understanding of what life has to offer,” she says. “Transplant recipients are proof of the extraordinary strength and resilience that is within all of us.”

Grant Searcey is one transplant recipient who views life from a new perspective. He was 18 and near completion of high school in his native Nebraska in 1994 when, in the middle of a pickup basketball game, he began to have trouble breathing. In the emergency room, he was found to have a resting heart rate of 130. He was diagnosed with severe idiopathic cardiomyopathy, and received an internal defibrillator. The device and medications enabled Searcey to live a somewhat normal life through most of his 20s, though the former competitive swimmer was forbidden from any exercise more strenuous than his daily walking.

By mid-2004, it became clear that even with the mechanical and medical assistance, Searcey’s heart had just about run its course. “I was told transplant was my only option, and that if I went into one more funny rhythm I might die,” he says. In June, Searcey was transported with two paramedics and two pilots from a hospital in Albuquerque to UCLA Medical Center, which he knew to be “the best heart transplant hospital in the world.” As he lay in his UCLA hospital bed on the transplant waiting list, the 28-year-old multimedia artist drew a detailed picture of a healthy heart; underneath it, he wrote, “I look forward to meeting you.” The next day, he was told a match had been found. Now back home, with a new heart and new hope, Searcey says he feels great for the first time in his adult life. “I was reborn—physically, mentally and spiritually,” he asserts. “I have a new body that works, and I see the world completely differently. Things that used to worry or bother me are no longer a big deal. And I just enjoy every moment.”