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Spring 2007

Forty years of transplantation at Loma Linda

Loma Linda University

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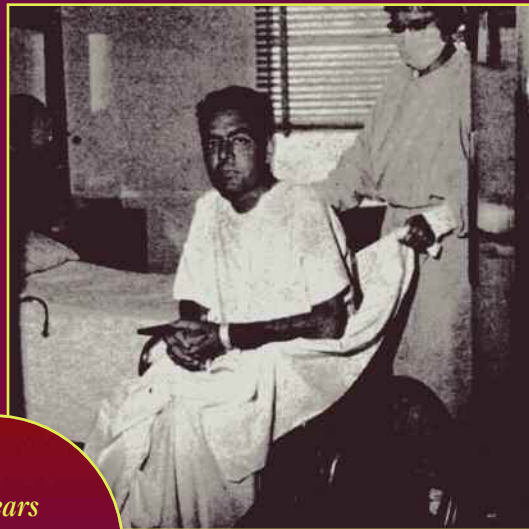
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SCOPE

*LOMA LINDA UNIVERSITY ADVENTIST
HEALTH SCIENCES CENTER*



*40 years
of transplantation
at Loma Linda*



Spring 2007

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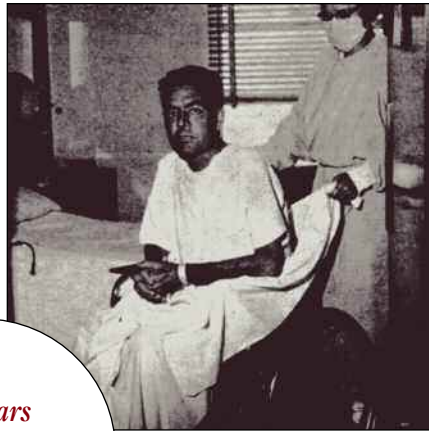
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*40 years
of transplantation
at Loma Linda*



On the covers...

On the front cover:

TOP LEFT: Leonard L. Bailey, MD, and his team perform a heart transplant on Baby Fae, using a baboon heart because no system was in place to identify human donors (page 7).
 TOP RIGHT: Paul Anderson received the first kidney transplant at Loma Linda in April of 1967. Performing the historic surgery was Lou Smith, MD, general surgeon (page 2).
 BOTTOM LEFT: Maria Isabel Ancona received her liver transplant at just 16 months of age at Loma Linda University Children's Hospital on December 26, 2003 (page 2).
 BOTTOM RIGHT: Baby Fae looks pink and healthy following her historic surgery. Her new heart remained strong, though she eventually succumbed (page 7).

On the back cover:

TOP LEFT: Paul Nobuo Tatsuguchi was Japanese; J. Lawrence Whitaker, American. But both young men were Seventh-day Adventist Christians. Furthermore, they were classmates, graduating from the LLU School of Medicine in 1938. In May 1943, their lives converged again on Attu. Both men were now military doctors, on opposing sides of the war (page 16).
 TOP RIGHT: A little more than a year ago, the Mobile Telemedicine Vehicle (MTV), part of a joint effort between the U.S. Army and Loma Linda University Medical Center, known as the DISCOVERIES project, was unveiled (page 20).
 BOTTOM: Members of the pediatric trauma team gather on the helipad (page 12).

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Transplantation at Loma Linda

It's been 40 years since the first kidney transplant at Loma Linda

BY PRESTON CLARKE SMITH

The surgeon who performed the first kidney transplant with long-term success made the following remarks during an address at the U.S. Transplant Games of 2004 (sports event for transplant patients): “George Elliott once wrote ‘Prophecy is the most gratuitous form of error.’ I make no prediction about future medical progress. However, I am certain that organ transplantation will forever remain as one of the greatest gifts to the body and soul of mankind.”

That surgeon, Joseph Murray, MD, performed the historic kidney transplant at Boston’s Peter Bent Brigham Hospital in 1954.

Ever since the first successful kidney transplant, organ transplantation has offered hope and healing to thousands of people previously without any treatment options. Thirteen years after that historic surgery, organ transplantation became part of Loma Linda University Medical Center’s continuing journey “to make man whole.”

The Medical Center began offering solid organ transplantation in April 1967 when its first kidney transplant created a health care milestone for the institution. That first transplant marked a new era for Southern California’s Inland Empire as solid organ transplantation became an available treatment option for patients with end stage kidney disease.

During the ensuing 40 years, the transplantation program has grown to become a major center and includes liver, pancreas, heart, and, most recently, bone marrow transplants, with a combined total of more than 2,700 transplantations performed.

The early years

Louis Smith, MD, a general surgeon at Loma Linda University Medical Center, spent time in the mid-1960s at Peter Bent Brigham Hospital in Boston learning kidney transplantation surgery from Dr. Murray.

Upon his return to Loma Linda, Dr. Smith performed the first kidney transplant at Loma Linda in April of 1967 in the old hospital located on the hill where Nichol Hall now stands. The surgery was performed on a 38-year-old man who had suffered from kidney failure, severe hypertension, and generalized seizures.

In a few short months, construction on the present-day Medical Center would be completed and the new facility opened for patient treatment. In these early years of transplants, a small team without formal direction or centralized access to resources continued working with Dr. Smith and building the legacy of transplantation at Loma Linda University Medical Center.

“In those days, patients had a fairly high risk of death from transplantations,” remembers Sieg Teichman, MD, a nephrologist who joined the Medical Center in 1974, and who worked with Dr. Smith and Theodore Mackett, MD, a general surgeon who continued the kidney transplantation program. “But at the same time, there were no chronic dialysis treatments available, and there weren’t any other options for patients with kidney failure.”

For the next 18 years, kidney transplantation would be the only solid organ transplantation done at Loma Linda University Medical Center. For the first

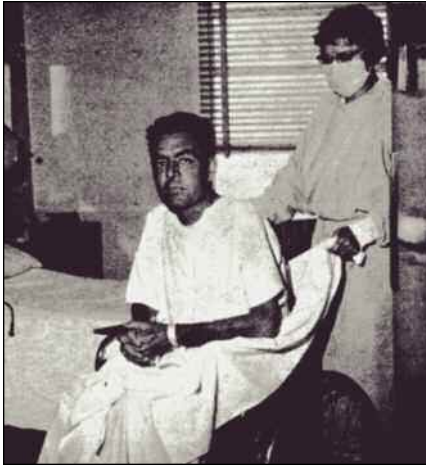
decade, five to six transplants were done each year. Once dialysis became available as a long-term treatment option in the 1970s, the number of yearly transplants grew from 5 to 15 per year, then to 30, and continued to expand to the current pace of more than 100 kidney transplants each year.

The kidney transplantation program would lay the groundwork for all other transplantation programs to come—heart transplantation, beginning in 1985; liver transplantation, commencing in 1993; and bone marrow transplantation starting in 1999.

The United Network for Organ Sharing (UNOS), the national regulatory



The first successful long-term organ transplant is performed by Dr. Joseph Murray and the medical staff at Boston’s Peter Bent Brigham Hospital, in 1954. *Photo from Surgery of the Soul, Reflections on a Curious Career (2001), by Joseph E. Murray, courtesy of the publishers, Science History Publications USA, division of Watson Publishing International LLC.*



Paul Anderson received the first kidney transplant at Loma Linda in April of 1967. Performing the historic surgery was Lou Smith, MD, general surgeon, who had studied with Joseph Murray, MD, at Peter Bent Brigham Hospital, in Boston.
(University SCOPE, Wednesday, May 24, 1967, p. 11)

agency for transplantation that received the initial federal contract to operate the Organ Procurement and Transplantation Network (OPTN) in 1986, certified LLUMC for kidney transplants in August 1987. This was the same time the Medical Center received Medicare certification for kidney transplants.

An institute is born

By 1992, more than 400 kidney transplants had been performed at LLUMC. Heart transplantation had experienced seven years of success, and liver transplantation was soon to be added to the list of solid organ transplantations the Medical Center would offer to patients in the Inland Empire. The need for centralization and organization of transplant services into a specialty care was becoming all too clear.

Medical Center administrators began developing serious plans for a centralized transplant service in 1992, with the recruitment of a multi-organ transplant surgeon from the Mayo Clinic. The addition of Erik Wahlstrom, MD, the

first dedicated transplant surgeon at LLUMC, provided the cornerstone needed to begin building and growing the transplant program.

Following this, UNOS designated Loma Linda University Medical Center as a liver, pancreas, and kidney transplant center in October 1992.

The Transplantation Institute was born. The designation followed 463 kidney transplants over a period of 26 years. Making it all possible was a decision by the Southern California Transplantation Society, which controlled organ distribution in the Los Angeles area, to allow combined kidney and pancreas recipients to take precedence over patients waiting for a kidney alone—in other words, give priority to a patient who needs both organs from one donor. Candidates for the combined operation are typically diabetics with kidney failure.

Also contributing to the inauguration of the Transplantation Institute was an agreement between all transplant centers in the Los Angeles area for LLUMC to become the first institution in the region to perform such surgeries.

Reorganization of the Transplantation Institute during 1992 and 1993 combined all services necessary for pre- and post-transplant recipients, such as social services, financial counseling, pharmacy, and dietetics. The Institute's formal organization also brought together surgeons, anesthesiologists, nephrologists, gastroenterologists, immunologists, and pathologists, composing a multidisciplinary and multicultural management team for transplant patients.

In January 1993, the Transplantation Institute initiated its kidney/pancreas transplant program for diabetic patients. Following transplant, these patients no longer needed hemodialysis or insulin injections.

The first kidney/pancreas transplant patient was a 29-year-old man from Rancho Cucamonga, California, who had such a severe case of diabetes that his kidneys were damaged and useless, and

he was forced to undergo hemodialysis to cleanse his blood. His diabetes was so devastating to his body that he faced potential blindness, coma, gangrene, heart attack, stroke, and even death.

Following his kidney/pancreas transplant, he spent just 11 days in the hospital and left with normal kidney function, no longer a victim of diabetes. His mother came to refer to the day of his transplant as his "second birthday."

There have been a total of 151 kidney/pancreas transplantations since that first operation. Another milestone in multi-organ transplants came in November 1993, when a rare combined heart/kidney transplant was performed on an 11-year-old boy at LLUMC.

In September 1993, the Medical Center became the only institution in the Inland Empire and only the third hospital in Southern California to offer adult liver transplants. The first liver transplant patient was a 54-year-old man from Salem, Oregon, who suffered from chronic hepatitis B and C.

The surgery, which can sometimes last 12 hours, proved to be another formative milestone of the Transplantation Institute. The second liver transplant was done a mere four days later on a 40-year-old man from Tucson, Arizona. To date, 307 liver transplants have been performed at LLUMC.

Since its inception, the Transplantation Institute has developed adult and pediatric programs in kidney, liver, pancreas, and bone marrow transplantation.

In addition to direct transplantation services for solid organs, the Institute offers medical management of hepatobiliary disease for non-transplant patients. Teams in the Institute run a hepatology clinic and cirrhosis management program to help patients avoid transplantation.

"It's an honor to be part of a team that decides what's best, long-term, for the patient—and that's not always transplant," says Margie Imthurn, director of the Institute's clinical services.

The Institute brings together highly qualified professional and support staff to

serve patients at all points along the continuum of care, and effectively collaborate as interdisciplinary partners.

“People ask me what unit transplant is, and I have to stop and think which unit we don’t have contact with,” notes Judy Reynolds, MBA, who has served as executive director for the Transplantation Institute since November 1997. “So many services help us, from the clinical laboratory to infectious disease, to anesthesiology in the operating room, to finance to social work—we couldn’t do it without any of them.”

Gaining recognition

In addition to patient care, an important issue facing all transplant centers is certification from the national governing bodies, such as UNOS and Medicare. Without it, public and private insurances will not recognize or reimburse transplant services.

The Transplantation Institute began with UNOS certification for kidney (1987), kidney/pancreas (1992), and liver transplants (1992). The institute has also enjoyed Medicare recognition of its kidney program since 1987.

In December of 1994, the 600th kidney was transplanted at the Medical Center. At that time, kidney patients enjoyed a one-year graft survival of 95 percent, and, more important to them, the patient survival rate was 97 percent. Several patients at the time had maintained transplanted kidney function for more than 20 years. The continued excellence in patient care and clinical outcomes soon led to more certifications and recognition of the institute as a leader in solid organ transplantation.

By March of 1995, Medicare granted certification to the heart transplantation program. UNOS certification followed in November.

In 1997, the Institute still lacked Medicare certification for the liver transplantation program. “When I came on at the end of 1997, I had several conversations with Dr. Moorhead, our president at the time, and he told me ‘This is the



Veronica Waring and her daughter, Armani, celebrated the little girl’s first birthday at the end of August 2003, made possible by a liver transplant she received earlier in the year at Loma Linda University Medical Center’s Transplantation Institute.

most critical thing we need you to work on,” remembers Ms. Reynolds. “So for the next six months, I lived and breathed Medicare standards and criteria.”

Her efforts were not in vain. Medicare certified the Transplantation Institute’s liver program on April 2, 1998. The certification letter is framed and still hangs in Ms. Reynolds office.

In 1998, the United States Postal Service selected LLUMC to be one of its national sites for unveiling a 1998 organ and tissue donation stamp.

First-day ceremonies were held August 5, 1998, in Columbus, Ohio, in conjunction with the U.S. Transplant Games, August 5 to 8. Official unveiling ceremonies were also held at key locations across the United States to promote organ donor awareness. Because of its long history of infant heart transplantation, and in light of the Transplantation Institute’s growing success, Loma Linda was chosen as one of a handful of sites nationwide where the stamp was unveiled.

The institute today

To date, LLUMC’s Transplantation



Maria Isabel Ancona, shown here at about 4 years old, received her liver transplant at just 16 months of age at Loma Linda University Children’s Hospital on December 26, 2003.

Institute has performed 1,681 kidney transplants, 179 pancreas transplants, 307 liver transplants, 597 heart transplants, and 167 bone marrow transplants. The institute offers a comprehensive program that provides services in the areas of liver, heart, kidney, kidney-pancreas, and bone marrow for pediatric and adult patients. More than 60 health care professionals form a core group that is committed to providing excellent patient management.

The renal (kidney) transplant program provides comprehensive evaluation and transplant-related services to patients with chronic renal failure or end stage renal disease (ESRD). Services include cadaveric, living-related, and living-unrelated renal transplants, as well as all aspects of dialysis access surgery.

“Living kidney donation is very gratifying,” says Ms. Imthurn of the living transplants. “There seems to be a heightened sense of appreciation in those cases. Every living donor frees up an organ for someone else. I’m passionate about living donation. To me, it restores your faith in humanity. It inspires the staff.”



Juanita Padilla, 17, receives some help from her mother in preparing for her high school graduation ceremony in her hospital room on unit 4800 at Loma Linda University Children's Hospital. She enjoyed a complete in-hospital ceremony, thanks to her teachers and counselors at Moreno Valley High School in June 2004. Diagnosed with acute myelogenous leukemia in September 2001, Juanita received a bone marrow transplant from her brother in April 2004.

In addition to the adult transplant program, the institute also has a very active pediatric kidney transplant program, providing kidney transplantation to recipients as small as 13 pounds (6 kilograms).

Every potential recipient's evaluation benefits from a comprehensive team approach, including the following:

- Transplant surgeons
- Adult and pediatric transplant nephrologists
- Transplant nurse coordinators
- Financial coordinator
- Social worker
- Transplant pharmacist
- Transplant nutritionist

The liver transplant program provides comprehensive care to the adult and pediatric patients with liver disease. The primary goal of the program is to



Lance Cpl. Christopher LeBleu thanked the Medical Center staff for helping him live long enough to receive a donor organ liver and for a successful transplant surgery on January 31, 2005. He was transferred from Twentynine Palms on January 26, 2005, and placed on the transplant list that night after doctors diagnosed him with acute liver failure. The marine had just completed a seven-month deployment to Iraq in September 2004, where he conducted support and stabilization operations.

restore those with end stage liver disease to an optimal level of health and to allow them to lead a productive life.

Throughout the past 10 years, the institute has implemented strict guidelines for evaluating and treating patients with liver and kidney disease. These guidelines are part of a more conservative approach to the treatment of liver disease. Emphasizing education and prevention over more traditional therapies, the transplant team has seen positive results. Several patients have improved so much that they have been able to go back to work—some even to the point of being removed from the transplant waiting list.

Within the past year, the number of days most patients stay in the hospital after transplantation has been drastically

reduced. As a result, much of the education with the patient and family must be accomplished prior to surgery, as well as post-transplant.

"I believe the statistical data shows the success we've had in creating a seamless inpatient/outpatient service line with continuity and excellence of care as the hallmarks of an ethically sound, world-class transplant center," remarks Ms. Imthurn.

Education and prevention

At Loma Linda, candidates for organ transplantation enjoy a network of support made up of a multidisciplinary team of specialists. However, the most important members of the team are the patients themselves, and they must play an active role in the maintenance and preservation of their own health.

"We're big on teaching," agrees Ms. Imthurn. "Our coordinators spend a huge amount of time with patients before discharge telling them what to expect and how to take care of themselves." She adds, "One of our biggest challenges is educating patients and families about the importance of compliance—taking their immunosuppressant medications exactly as prescribed."

The Institute has implemented an aggressive patient education program that focuses on the many needs of transplant patients and their families. Developed over the past several years, the program now offers patient education courses in various areas of transplant that may be of concern to the patients and family members.

Prevention is also an important area that the Transplantation Institute has addressed. The Transplantation Institute has in place a program to make the community aware of the risks of hepatitis C, liver disease due to obesity, and alcohol/liver diseases. While one goal of the institute is to work closely with transplant patients and their families, another equally important goal is to make a difference in the community as a whole.

Through education, the institute



Acting district manager of the San Diego postal district Glenn Crouch (right) unveils the new organ and tissue donation stamp during ceremonies held August 5, 1998, at Loma Linda University Medical Center. Looking on are (from left) Floyd Petersen, MPH, then mayor, city of Loma Linda; Leonard L. Bailey, MD, chair, department of surgery; and J. David Moorhead, MD, then president and chief executive officer, Loma Linda University Medical Center.

introduces early or preventive measures, so that individuals can avoid progressing to where they need a transplant.

The prevalence of hepatitis C has increased to the point where it has become a leading type of liver disease. Patient information is available regarding hepatitis C, and the Transplantation Institute has worked to make this available to the community through videos and written literature.

For hepatitis C, it is particularly important to entirely avoid alcoholic beverages. Studies show those who drink are more likely to progress more quickly to cirrhosis (hardening of the liver).

The institute also has a screening program to detect hepatitis C early and to educate the public about it.

Staff members from the institute travel to alcohol and substance abuse treatment centers in the area to talk to the clients about liver disease. Hepatitis C is the main topic, since it affects that particular population more than others. Staff members discuss the disease and what individuals should do to protect themselves.

An important approach of the Transplantation Institute is the use of support

groups. Within these groups, transplantation recipients can share their stories, and give encouragement and support to others awaiting a transplant, or to those who have already received one. Emphasis is on living life to the fullest and not focusing on the fact that one has a disease.

Social workers show patients that, though they have to deal with the fact that they have a chronic illness, they can still lead an active and normal life.

Education plays a vital role in the prevention of disease.

The Transplantation Institute holds the philosophy that a dollar spent on education and prevention about kidney, liver, or heart disease is a dollar well invested. The Institute places prevention education so highly that the process starts in childhood whenever possible.

Research

In addition to the patient services provided on a daily basis, the Institute is also internationally recognized as a leader in innovative research for the field of transplantation.

The research team consists of transplant surgeons, hepatologists, nurse prac-

tioners, pharmacists, scientists, a research coordinator, and supporting medical staff.

A broad spectrum of research within the Transplantation Institute ranges from clinical trials involving study participants to molecular research. All clinical studies are performed either in conjunction with pharmaceutical companies, or initiated by physicians within the department. These studies are closely monitored by an institutional review board, which assures safety and compliance in all research matters. The knowledge gained from this research leads to the development of improved drugs and techniques to benefit transplant recipients.

The Center for Transplant Immunology Research is a division of the Transplantation Institute, where immunological approaches to transplant are state-of-the-art. At the Center, scientists examine transplantation at the cellular level, with a focus on solid organs, hepatopoietic cells, pancreatic islet cells, and stem cells. Through the collaborative efforts of clinicians and scientists, cutting-edge approaches to transplant are being developed.

The future

“The last 10 years have been a real focus on growth,” mentions Ms. Reynolds. “It’s going to take good physician leadership to take us to the next level. And we have a great team of physicians to provide that.”

“We are currently seeking a new, unique certification from the Joint Commission as a transplant institute,” says Ms. Imthurn. “This [2007] is the first year this certification is being offered. We are certified under the Medical Center, but this will be a specialized certification that will speak to the standards of care we meet,” she details.

There are opportunities to participate in clinical trials at the Transplantation Institute.

For information, please contact the Transplantation Institute and Liver Center at (800) 548-3790. *SCOPE*

Remembering Baby Fae

Dr. Bailey tells the story of Baby Fae and Baby Moses, leading up to and including the first-ever successful neonatal heart transplant in history

AN INTERVIEW WITH LEONARD L. BAILEY, MD; BY LARRY KIDDER, MA

It was my privilege to sit down recently with Leonard L. Bailey, MD, and listen as he recounted his experiences leading up to Baby Fae's historic heart transplant on October 26, 1984—just 12 days after her premature birth with hypoplastic left heart syndrome. The heroic efforts of Dr. Bailey and his team to save Baby Fae included the use of a baby baboon heart. Her brief life gripped the world as few stories have and raised awareness of the need for recovery of infant hearts and other organs to give these otherwise healthy children a chance to live and thrive. Dr. Bailey has a deep appreciation for the laboratory animals who gave the gift of life so that transplant research could take place. —LK

While I was still in training, I had already made up my mind that someone needed to investigate transplantation in newborns. At that time, babies born with certain kinds of exotic heart disease weren't even treated—they were set aside to die. And they uniformly did that.

I had encountered some of those babies. We tried various things to see if we could prolong their lives. Mostly we prolonged their dying, maybe by a few days. But we had no success at all in saving them.

I'd had a fascination with transplantation since visiting a laboratory at Stanford while I was in medical school. I thought the natural thing would be to put the two together—babies born with incurable heart disease who are dying, and this transplantation technology that hadn't found life yet in this age group.

Oddly enough, one of the very first transplants—and probably the first

transplant done in this country human to human—was on a newborn baby. Dr. Adrian Kantrowitz in New York had done a few infant animal transplantations in his laboratory, and had this same notion that transplantation ought to be good for babies with broken hearts too.

So he made that attempt in 1967. The baby actually didn't survive. I believe they were able to get the baby out of the operating room and into the intensive care unit for about five or six hours, and that was as far as it got.

Of course, transplantation of the heart was all the news at that time. Dr. Chris Barnard in South Africa had done the first human heart transplant using another human heart.

Dr. Jim Hardy had put a chimpanzee heart in a human down at the University of Mississippi, in Jackson, in the mid 1960s. He had a patient with terrible heart disease whom he couldn't wean off the heart/lung machine. He'd always had an interest in the idea of transplantation but hadn't worked it out fully. Nevertheless, he went down to the lab and found an aging chimpanzee, harvested the heart, and put it in this fellow. It worked for awhile, but it wouldn't sustain his circulation beyond the operating room.

When they performed an autopsy on the chimpanzee's heart, lo and behold, the old chimp was suffering from severe coronary artery disease. It probably wasn't really a fair situation.

That wasn't something done in isolation. Dr. Keith Reemtsma had transplanted chimpanzee kidneys into human beings at Tulane in those early days, and

actually had done reasonably well with that group of patients. One ended up surviving eight or nine months and was back on the street living a reasonable life. That's at a time, to put it in perspective, when we really didn't know anything about transplantation or about how to suppress the immune system. We had some arcane medications to use, but nothing very good yet had come along.

When I returned to Loma Linda from training, the surgery department was very generous with me. They budgeted some money for a laboratory. We got the laboratory going again—it had kind of fallen idle for a while. Dr. Lou Smith, who did the first organ transplant at Loma Linda University, had an active laboratory program going for a number of years. He had become so busy clinically that he couldn't keep it going, and it had fallen



Leonard L. Bailey, MD



quite idle. I didn't see any merit in that.

So we found some funding, put the lab back together, and hired some technical people to help with transplanting and looking after some little newborn goats. We chose goats as recipients because, for one thing, they're lovely little animals, easy to test, and smarter than most animals—and very hardy, as opposed to lambs, which aren't nearly as tough. So lambs, at some level, became donors, and goats were always the recipients. And they were available; we had a farm facility where we raised them.

We would take a baby goat a few days old and do a heart transplant—orthotopic heart transplant—and that little baby would be jumping around the cage that evening. The next day, we would put it in the pens with other goats, and then in a week it would be back out on the farm with its transplanted heart. What we wanted to learn was how far they would go.

One of the greatest stimuli I had when I was studying pediatric heart surgery up in Canada was the awareness that the newborn immune system is indeed fairly special—it has very little of the aggressiveness of the older child or an adult. It has no experience, which helps. And much of the suppressor type behavior is still intact in the newborn.

So the possibility that a newborn

could receive a graft and actually grow up without any immune suppression was curious enough. We were able to demonstrate close to that. We had a baby goat named Livingston who was transplanted as a newborn and grew to 6 months of age with no immunosuppression at all.

On average however, the transplanted goats without immunosuppression survived about two and a half months. Then they began a slow rejection process. So their immune systems, we knew from that experience, were intact—they were just much more accommodating as newborns.

Then we wanted to know what we could do to manipulate the immune system some way or other. We set up a series of experiments with various modifications to observe the host immune response. As it turned out, none of the modifications lengthened the mean survival rate.

A fellow by the name of John Borel, in Basil, Switzerland, was working for a pharmaceutical house. He had found a fungus-like substance out in the hills. His job was to study it and see if there was anything there that he could make a medicine out of. I think he was originally looking to see if he could find something that would be effective with allergies.

But he began to study the immune properties of this substance and how it might alter the immune response in a host. It was pretty promising—something called cyclosporin. It was called cyclosporin-A at that time. I suppose they thought there would be cyclosporin-B, C, and D.

So this substance was being studied in the laboratories of the Swiss pharmaceutical house, and by other laboratory investigators around the world. Here in the West, Stanford had access to it. I contacted John Borel—I'd met him earlier at a presentation I was making one time down in Texas. He had agreed to send me some of this material.

He began to send this material to me in brown jars. It was a powder. You had to mix it with some oily substance in order to get it suspended. And then you could begin to quantitate how much you were giving an animal. We prepared a group of little goats for allograft transplants—goat to goat. Mind you, there were frequently different subspecies of goats, but they were similar enough.

We performed the transplants and treated them with cyclosporin all along. With that, they lived indefinitely. That was all it took. Cyclosporin-A became the mainstay of our immunosuppression.



Dr. Bailey and his team perform a neonatal heart transplant on Baby Fae, using a baboon heart because no system was in place to identify human donors.

That took our breath away—the fact that we could transplant a baby at birth and have that baby grow up with nothing more than receiving injections of this oily substance. The baby goats would go down to the farm, grow up, become big herd animals, and actually grow old. And if they didn't get in trouble, they would die just of old age.

As goats do sometimes, they get into a lot of trouble with things they eat. One of our older goats, one named Sigmund, was about 3 or 4 years old and he got into our rubber glove supply—he ate all of these rubber gloves and died of an intestinal obstruction.

Then we thought, “Well, how are we ever going to transplant baby humans? We don't have a system for identifying potential donors for baby humans, so if we're going to transplant them, we're probably going to have to start with cross-species. So we began to transplant lamb hearts into goats, and even pig hearts into goats. We had some really fascinating survival with these cross-species transplants, using cyclosporin-A alone.

And then we began to study what would be a potential donor for a human being. Chimps were out, and orangutans and gorillas—they're all endangered. We

wouldn't think of using an animal like that. But baboons seem to have a life of their own; they're extraordinarily plentiful. There are actually programs to control the populations in South Africa and places like that. They are hardy animals and reproduce easily.

We thought, “Now here's a subject we can study.” We soon discovered that more than 80 percent of the DNA in a baboon is identical to that of a human being. The human leukocyte antigen (HLA) typing method is used to identify your tissue as being you and not your neighbor. We found we could actually type baboons. And we could put baboon cells and human cells together and pretend to do transplants in the laboratory, and find out which baboon might be the most compatible with any one human being's sample.

There were three or four important immunologic bench studies that we could do to select a baboon donor. The first thing we did was acquire some baboons. We contacted our friends in southwestern Texas at a huge primate center—probably one of the best, if not the best one, on the planet. We told them what we wanted. We preferred juvenile female baboons. We didn't want to have any male baboons growing up

and tearing up the cages.

Sure enough, they were able to provide some juvenile female baboons. They would wean the baboons there and then ship them out to us. So we had about a dozen of these juveniles that we called our donor panel. We did some other bench studies—for instance isolating a baboon heart and then perfusing that heart with human blood in an isolated heart preparation—and did the same thing with the goat and pig hearts. With the barnyard animals, none of the hearts functioned at all; the little baboon heart functioned beautifully for 12 hours in that experiment.

We needed Institutional Review Board approval. It took 14 months from the time we started to when we received approval from the board. As I recall, Dr. Dick Sheldon was the chairman of the board at that time. He was a terrific ally—not that he was all for it, but he just did a really superb, objective job of assessing and moving his board through the process.

We had to bring in external reviewers. We brought in a number of people to review the protocol and give us their opinions. These were prominent transplant people who were involved in the process, and we had various opinions of course—some were somewhat supportive, some were not supportive at all.

One of the opinions was “Why not?” That opinion came from Dr. Sandra Nehlsen-Cannarella. And she agreed to serve as our chief corresponding immunologist as we went forward. She told us she would be available—if we ever tried this clinically, she would be on the next plane and come out and help us. And sure enough, that happened. Ultimately, Dr. Bruce Branson hired her and she moved from where she was in New York out here, and was here for a number of years as the chief of immunology.

The time came when we were very close to being ready to start. The protocol was to do five of these cross-species transplants with newborns with



Baby Fae looks pink and healthy following her historic surgery. Her new heart remained strong, though she eventually succumbed.

hypoplastic left heart syndrome. I was stopped in the hall one day and one of our pediatric cardiologists, Dr. Gene Petry, asked, “You know, Bailey, how’s that protocol coming? I happen to have a baby in the nursery now with this problem. Are you interested?” I said, “Well, let me do some checking.” I got back to him and said, “Yes, I think we are.” He said, “Well, I’ve discharged the baby home to die. The baby and her family live up in the high desert. I’ll have someone contact them and see if they have any interest.”

So one of four neonatologists, Dr. Doug Deming, called this mother and said, “We have this protocol that’s never been tried just like this before. Do you have any interest?” And they thought about it and phoned back, and said they thought that they might have an interest and that they’d like to talk more about it. We invited them to come down—we spent hours actually in discussion. Part of the protocol meant that they had to sign a form saying they were interested. And then at some point or other, within another 24 hours they had to sign again, saying they were still interested and would give us the consent to go forward.

After the first meeting, they indicated they wanted to go forward with it. The baby was up in the desert and beginning to die. They brought the baby back down. We did what we needed to do, which, in those days, wasn’t very good, to try to keep the baby alive. The assays comparing the baby with the baboon panel were supposed to have taken about a week, but on or about the sixth day or so of this effort, the baby was clearly going to die that day. We needed to move forward so Dr. Nehlsen-Cannarella read the tests a bit early. As it turned out, the tests identified one of the baboons that was most compatible, and that little baboon was set up to become the donor.

I should mention that, months before, we had screened these juvenile baboons for infectious disease—for everything from A to Z that we knew



Drs. Bailey and Nehlsen-Cannarella check to see how Baby Fae is doing.

and were able to test for in those days—and we knew they were clean. They had come to us clean, but we retested them to be sure they were to our satisfaction.

Now we had this donor panel that was ready to go. It came down to the day. I knew that Baby Fae was getting closer and closer to dying, and so we knew that we were going to do it the next morning. We heard rumors toward the end of our preparation that some newspaper up in the desert had heard about it. I don’t know how the leak happened, but it did. We were able to placate the news people at least until after the transplant was done. Fortunately, the pre-operative story stayed local and didn’t spread.

We had done many of these newborn transplants in the laboratory—transplanting with a human newborn was just the next natural thing to do. I don’t recall being terribly nervous about it; I didn’t have much angst over it at all. Actually I was at a restaurant in Redlands the night before with my wife, Nancy. We discussed the situation together a little bit—what the consequences might be.

We didn’t have any idea of course what might happen, but we thought we should at least discuss it, and we did.

The next morning, I popped up and was down at the lab by about 6:00 in

the morning. Howard Shattuck, our surgical assistant originally brought in from Johns Hopkins, was my right arm in the laboratory surgically, helping me with the transplants. So I had him on the other side of the table with me, as well as some residents.

We gathered around the operating table. I brought the heart up from the lab. I remember taking the heart out and going up the back stairs and into the operating room. We had Baby Fae all ready. I arrived with the heart, we made the incision, and went to work. We’d done it so many times, although we’d never really worked with hypoplastic left heart syndrome. It cast a slightly different nuance on the surgery, because the whole aortic arch had to be reconstructed as part of the process. We had dreamt of how it might go, but we’d never actually done it in exactly this way in a baby.

We were blessed. It just turned out beautifully. Her response to the surgery was just perfect.

I expected some reaction to it. I remember what went on with Dr. Chris Barnard, for instance. It was like a three-ring circus in Capetown.

I didn’t think that Baby Fae’s transplant would set off so many alarms. I



Now 21 years old, Eddie, who was known as Baby Moses, is the longest surviving newborn recipient of a heart transplant. He is age 3 in this photo.

thought there might be some regional interest, but the story became world news. That part of it was a little surprising. And it was a bit of a distraction—it did affect her care. We felt like we were operating in a glass bowl.

Initially, Dr. Branson and others took over talking with the news people. Dr. Nehlsen-Cannarella and I, and our team were focused on Baby Fae. We were there day and night. We didn't know exactly what to expect, and didn't want to miss anything either, and so we were just there. And then of course, toward the end, it became heartbreaking—we were losing her and we didn't quite understand why. Her heart was “gangbusters” still, and yet she was dying. We knew we hadn't overdone the immunosuppression or anything like that.

To this day, it's a bit of a mystery what went on. Anyhow, she died, and that was heartbreaking. We invested a lot of time, energy, and effort. We had gotten to know her family.

It was also an institutional thing. I don't recall the institution ever being quite as unified on anything as over this little baby. We all wanted her to go further, and it was a major letdown.

And then, of course, there were all sorts of second guessing, “7th inning”

discussions, that went on, some of which we tried to listen to with an objective ear and learn from. Some were just wild—show business, I guess you'd say.

The media frenzy finally boiled down to a simmer. It was an election year, and you hardly knew Ronald Reagan was being reelected. This process was right at the same time. It nearly knocked him off the front page!

The hate mail and threats poured in for a long time, so much so that the Redlands police wanted us to let them open our mail and things like that. They were excellent. They were a great hometown police department. They just took over. Wonderful. We felt very secure. We had two little children, Connor and Brooks, who were quite impressed when the police came up to the house and gave us all lessons about how to take care of ourselves.

When we did the first allograft transplant a year later with Baby Moses (his real name was Eddie), wouldn't you know there were several busloads of people who came out to picket the house. The Redlands police, stars that they are, only permitted these people demonstrate in front of our neighbors' house—I don't think our neighbors were even home. Up on our property and in our house, there were officials from the police department guarding us.

Just like Baby Fae, this first allograft transplant with Baby Moses was very serendipitous. It just so happened that Eddie was still in our hospital. An obstetrician from the Bay Area called me and said, “I know what you did for Baby Fae. Are you still doing transplants, because I have a baby here with birth asphyxia, and the parents want the baby's organs donated. Nobody else wants baby organs except you.” I said, “Well, I think we do want that heart.”

We talked to Eddie's mom and dad. They wanted to move forward. They'd lost a baby the year before to heart disease. So we brought that donor baby down to Loma Linda and we performed what it turns out was the first successful

clinical newborn heart transplant, done a year after Baby Fae. That hit the news too and went all around. I think initially the story received a life because people thought the heart was from another baboon donor. But then it took on a life of its own because he stayed alive. And for the next several months there was intense interest.

More important than the news—though that was vital—was the development of a donor base. Procurement agencies said, “Well, if Bailey's really going to do this, we'd better get ourselves up to speed too.” So procurement agencies all around the country began to make something out of this human story that was out there. And people began to consider donating if their baby had birth trauma or brain death—they began to consider organ donation.

Procurement agencies also began to work in that direction. So, ever since Baby Fae and Baby Moses, there has been a fairly steady flow of organ donors. There aren't that many—it's not terribly practical—but there has been a steady flow of somewhere around 100 a year nationwide.

One comment that I would make is that Loma Linda as an organization enabled it, and embraced it, and we pulled it off as an organization better, I think, than had I been at any other academic center in the world. With Baby Moses, we crossed the barrier of transplanting a newborn, something which hadn't been accomplished previously.

In 1984, the same year we transplanted Baby Fae, Sir Magdi Yacoub in London had performed an allograft on a newborn, and came close to being successful, but the baby died. To me, Loma Linda's claim to fame is the fact that our baby, Eddie, is still living. He was off in a corner dying when we found him. We brought a heart down from the Bay Area and put it in. Eddie is living up in Las Vegas and working at one of the hotels there. He's 21 years old.

So that's how it all comes around. The rest, as they say, is history. *SCOPE*

Everyday heroes

The pediatric trauma team exists to save young lives

BY PATRICIA THIO

As the pediatric critical care team makes its rounds on a normal Tuesday morning, 3-year-old Sebastian is ready to spend a day with his family.

Both his mom and dad have time off work to celebrate the birth of their second child. But first, they have to get ready for a routine check-up for their newborn at the doctor's office.

Sebastian's dad, Javier Barroso, tells his wife, Carmen, he is going to pull out the car after putting the baby's car seat in. Sebastian is told to put on his shoes and stay in the house as Carmen is getting the baby ready.

As Mr. Barroso backs out of the garage in their Ford Expedition... he feels a bump, and discovers a parent's worst nightmare. Sebastian is lying face down under the SUV.

On unit 5700 a call comes in. A physician from an area hospital speaks with the pediatric critical care attending physician at Loma Linda University Children's Hospital—one of 13 Level I pediatric trauma centers in the country.

Sebastian sustains critical injuries and is in a nearby emergency room. Right after the physician's phone call, the Children's Hospital transport team is

alerted about the event. Within 30 minutes, the pediatric nurse, respiratory therapist, and pediatrician gather the needed medical equipment and converge at the meeting place—in this case, the ambulance outside the emergency entrance.

While the EMT ambulance driver takes the team to the nearby hospital, they discuss the child's condition.

"His vital signs seem pretty stable," says Melissa Siccama, MD, pediatric resident, LLUCH.

"Rib fractures, right clavicle fracture..." says Jeff Ambos, RN, pediatric ICU nurse, LLUCH.

The team has one goal for the transport. "The first thing we do is stabilize the patient and make sure we cover every aspect of treatment," says Victor Bannis, RRT-MPS, respiratory transport team coordinator.

As they make their way to the nearby hospital, the young 3-year-old lies on a hospital bed with tubes connected to his little body, braces strapped around him, and cuts and bruises on his face and arms. His parents stand anxiously next to him, holding his favorite stuffed animal. The transport team now surrounds him as Sebastian's big brown eyes look in every direction to see

what's going on.

"Hey Sebastian, look what you've got," says Dr. Siccama soothingly as she gives Sebastian a cuddly teddy bear. "I'll put him right here next to you."

The team looks for additional injuries that the hospital may have missed and stabilizes Sebastian for the trip to Children's Hospital. They strap him onto a backboard and wheel him out to the ambulance for the trip back to Loma Linda University Children's Hospital.

"I love working with kids," says Mr. Bannis. "I find a sense of satisfaction going out and picking up the very sick patients and bringing them back to a higher level of care and seeing them get well."

As Sebastian is taken to the emergency room at Children's Hospital, the trauma service is activated immediately. Physicians, nurses, therapists, X-ray technicians—every specialist that Sebastian needs is present.

"I am so proud of our team," states Don Moores, MD, chief of pediatric trauma services. "They do so much, and they do it with such passion. You just have to see them once as a critically injured child comes in. And you see how





Just a few members of the hundreds involved in pediatric trauma services. The team transports more than 700 patients a year to Children's Hospital—one of 13 Level I pediatric trauma centers in the country.

hard they work to save the life of that child. It gives me a thrill every time I see it happen.”

A bit later, Sebastian is transferred to the pediatric intensive care unit, where the critical care team takes over. For many LLUCH staff, seeing a critically injured child hits home.

“I always think this could happen to my own child,” says Shamel Abd-Allah, MD, chief of the pediatric critical care division, who is a father of five. “It makes me work harder to save this life.”

According to Dr. Abd-Allah, Children's Hospital transports more than 700 trauma patients a year by ambulance or Mercy Air helicopters.

Just a couple of days after Sebastian is taken to LLUCH, the little athlete plays catch with his nurse, drives around his new matchbox cars, and basks in a sea of new toys that surround him on his bed.

“All the nurses have been really great,” shares Carmen Barroso, Sebastian's mom. She laughs, “Sebastian loves

it here. He loves all the attention and says he doesn't want to go home.”

Sebastian is discharged a few days after his accident with a colorful dinosaur sling for his arm, lots of toys and balloons, and a full recovery ahead of him.

But while in the hospital, Carmen hears chilling news about a patient in the next room. Their nurse tells her and Javier how fortunate they are.

In the room next door, a little girl has had a similar accident. However, being backed over in her driveway by a family member has left her brain dead.

“I would love it if I did not have to come in and take care of a child who has been injured,” says Dr. Moores. “But unfortunately, the world we live in is such that trauma happens. So we need to be here to take care of the kids who do get injured.”

According to Dr. Moores, approximately 95 percent of all trauma cases are preventable.

SAFE KIDS—a nonprofit organization dedicated solely to preventing unin-

tentional childhood injury—has made a vast improvement in trauma deaths.

“This is well evidenced by the fact that over the last 30 years,” explains Dr. Moores, “trauma deaths per year in the United States have decreased by about 30 percent.”

The Children's Hospital trauma support services has a local SAFE KIDS coalition.

“Our outreach programs are truly there to serve our community, to strengthen it, to make it better and stronger,” says Michelle Parker, LLUCH SAFE KIDS coalition coordinator.

“Injuries that we try to prevent are all unintentional injuries,” says Ms. Parker. “We see children coming in who don't need to be hospitalized if there were just a few things done to create a safer environment.”

According to Ms. Parker, the most common trauma injuries are motor vehicle collisions, near drownings, pedestrian accidents, and falls.

SAFE KIDS at Children's Hospital

educates parents on how to prevent childhood injuries.

Protect your child in a vehicle

According to SAFE KIDS, four out of five car seats are used improperly. It can take up to 12 years for a child to be big enough for safety belts—close to 5 feet tall and between 80 and 100 pounds.

Until children reach that size and weight, they need to use car seats or booster seats for protection in case of a crash. Children will take three car seat steps before reaching step four, the safety belt.

Step 1: Infants should ride in rear-facing safety seats until they are at least 12 months old and weigh at least 20 pounds. “Facing the rear of the vehicle protects a baby’s neck and spinal cord from violent crash forces,” explains Ms. Parker. “If parents would leave children rear facing until they are 18 months to 2 years of age if the seat limits allow it, that would probably prevent many needless injuries.” Another point to remember: never put a rear-facing child in a front seat with a passenger air bag. If you must use the front seat, contact your vehicle manufacturer about availability of an air bag on/off switch.

Step 2: Toddlers more than a year old, who weigh 20 to 40 pounds and can no longer ride rear-facing, should ride in forward-facing child safety seats.

Step 3: Children more than 40 pounds must use booster seats until the lap and shoulder belts fit correctly (around age 8). A booster seat positions the lap belt snugly over hips and upper thighs, and the shoulder belt snugly across the chest and shoulder.

Step 4: Once safety belts fit children correctly, the lap and shoulder belts should be used. To fit correctly in a safety belt, kids must be tall enough to sit all the way back against the vehicle seat with knees bent over the edge. The lap belt should fit snugly over hips and upper thighs, and the shoulder belt snugly across the chest and shoulder.



The Barroso family shared their persevering story at the 2007 Children’s Hospital gala. Sebastian is perfectly fine now.

Prevent drownings

Two-year-old Brandon was full of life and love. He taught his family how to enjoy life and not sweat the small stuff.

“Brandon was a special child,” says his mother, Kim Patrick. “He had Down syndrome,” she adds, “yet, he was always smiling and laughing. He didn’t see it as a problem.”

Brandon would have been 9 years old this year, but he drowned in a backyard pool at the age of 2.

Since that devastating day, Ms. Patrick has dedicated her time to accident prevention.

“To go through the suffering and the pain that I feel is not something that I want other parents to experience,” she explains, “not for something that’s preventable.”

As the coordinator for Inland Empire SAFE KIDS coalition at Children’s Hospital, Ms. Patrick helps plan water safety demonstrations, among

other injury prevention programs.

Although swimming pools are the most common locations for drowning, Ms. Patrick says it has even happened in ice chests. When the ice melts, it turns into a potential drowning site. Other prevention tips include emptying kiddie pools and buckets. It only takes one inch of water to drown. Ms. Patrick describes drowning as a silent scream. A person cannot cry out for help when submerged in water.

“It’s important for parents to know that drownings don’t take a long time to happen,” says Ms. Patrick. “Within about 30 seconds to a minute a child has lost consciousness, and in about four minutes brain damage is starting to occur.”

Rialto firefighter Matt Payne shares the ABCs of water safety:

- **Adults:** constantly supervise your children.
- **Barriers:** a self-enclosed gate needs to surround the pool.



Shamel Abd-Allah, MD, chief, pediatric critical care division, checks Kaley Yerman's vitals in the PICU. Kaley was involved in a motor vehicle collision.

- **Classes:** children should take swimming classes, and adults should learn first-aid and CPR.

Keep kids safe near vehicles

The Barroso family members are very thankful that 3-year-old Sebastian is O.K. after being accidentally backed over by the family's SUV.

According to Kids and Cars—an organization committed to stopping deaths and injuries to children in non-traffic, motor-vehicle related events—at least 50 children are backed over every week. Of those, 48 end up in hospital emergency rooms and two result in death.

As vehicles become larger, visibility decreases. In a statistic released by Kids and Cars, there were 138 back-over fatalities between 1997 and 2001, compared to 474 between 2002 and 2006. Kids and Cars recommends the following to keep children safe:

- Walk around and behind a vehicle prior to moving it.
- Know where your kids are. Make children move away from your vehicle to a place where they are in full view before moving the car, and know that another adult is properly supervising children before moving your vehicle.
- Teach children that “parked” vehicles might move. Let them know that even though they can see the vehicle, the driver might not be able to see them.
- Consider installing cross-view mirrors, audible collision detectors, rear-view video cameras, and/or some type of back-up detection device.
- Measure the size of your blind zone (area) behind the vehicles you drive. A 5-foot-1-inch driver in a pickup truck can have a rear blind spot of 7 feet wide by 50 feet long.

Safeguard kids against falls

Falls are the leading cause of unintentional injury among children, according to SAFE KIDS. Children often fall at home—from windows, down stairs, or off of furniture. They also fall while playing outside—from bikes and other play equipment. Each year, more than 100 children ages 14 and under die, and 2.3 million are treated in emergency rooms for injuries from falls.

The SAFE KIDS “Falls Safety” brochure lists a number of different tips to protect children against falls.

Protect your child at home:

- Never leave young children alone on changing tables, beds, sofas, or other furniture.
- Always strap children into high-chairs, swings, changing tables, and strollers.
- Use safety gates at the top and bottom of stairs.
- Never let kids play on stairs.
- Infants in carriers should always be placed on the floor—not on tables or other furniture. Use all safety straps.

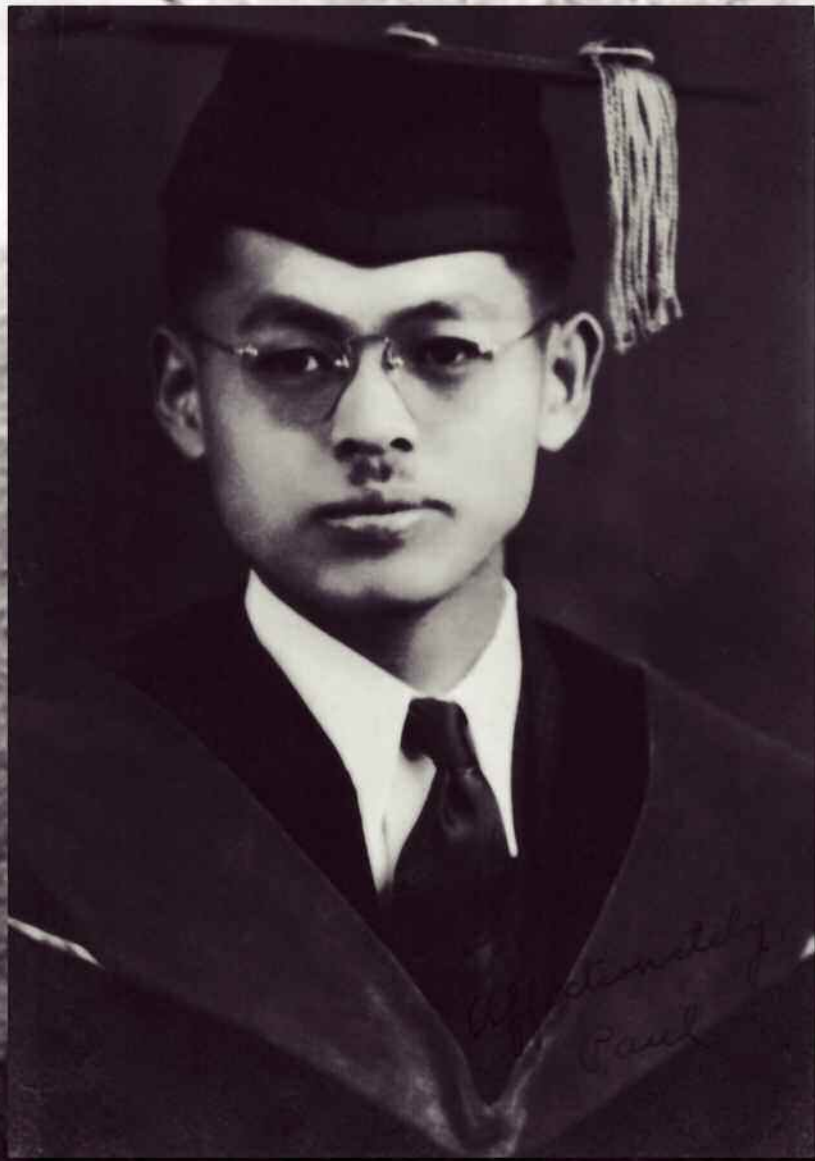
Protect your child around windows and balconies:

- Remember that children can fall from windows open as little as four inches.
- Move chairs, cribs, beds, and other furniture away from windows, window coverings, and balcony railings.
- Never rely on window screens to prevent falls.

Protect your child at play:

- Insist children wear their helmets correctly every time they ride their bikes, scooters, skateboards, or inline skates.
- Make sure children wear additional protective gear, including knee pads, elbow pads, and wrist guards.

For more safety information, contact the pediatric trauma service and Loma Linda SAFE KIDS Coalition by calling (909) 558-4704 or visiting the website at <www.llu.edu/lluch/safekids>. *SCOPE*



JAPANESE CEMETERY



Same family, different sides

Circumstance put classmates on opposite sides of a grim 1943 battle. One didn't survive—but he left behind a fascinating wartime account.

BY HENRY YEO, MD, AND HEATHER REIFSNYDER

It is famously said that the United States Civil War pitted brother against brother. But this is a story about brothers from different parents, different nations, different races. Brothers in the Christian family. They, too, belonged to different sides of a war.

Paul Nobuo Tatsuguchi was Japanese; J. Lawrence Whitaker, American. But both young men were Seventh-day Adventist Christians. Furthermore, they were classmates. Both attended Pacific Union College (PUC), in Angwin, California, and then the College of Medical Evangelists (CME)—now known as Loma Linda University. They each graduated as medical doctors in 1938.

In May 1943, their lives converged again—on Attu, the westernmost island of the Aleutian chain. Both men were now military doctors, on opposing sides of the war.

Of course, neither physician realized the coincidence during the nearly 20 days of torturous conflict, which ended with an American victory.

An amazing coincidence

On the last day of the fighting, Dr. Tatsuguchi was killed.

In the battle's aftermath, American soldiers, discovering the body of a Japanese medic, brought the deceased's medical bags to Dr. Whitaker. Inside was a medical textbook bearing the name of



Inset: Dr. Tatsuguchi's graduation photo. **Background:** A Japanese cemetery on Attu sits below a backdrop of forbidding terrain.

a third member of the class of 1938, Ed Lee, along with Dr. Tatsuguchi's name. Dr. Whitaker realized Dr. Tatsuguchi's presence on the island, and his death.

A Japanese diary also surfaced in the wake of the battle. The author's name was absent from the document, which covered 18 days of conflict on Attu. But the diary included details of the author's education and military career, which allowed him to be identified as Paul Nobuo Tatsuguchi.

A story that fascinates

The diary was translated and the story of Dr. Tatsuguchi was widely reported in newspapers at the time.

Almost 40 years later, in 1981, Loma Linda University briefly revisited the story, publishing a transcript of Dr. Tatsuguchi's diary in *Scope*. At this point, a third School of Medicine alumnus became intimately involved in the tale.

Henry Yeo, MD, graduated from medical school exactly 30 years after Dr. Tatsuguchi. When he read Dr. Tatsuguchi's diary in *Scope*, he was intrigued.

"I said, this is a fascinating, fascinating story. Where's the rest of it?" Dr. Yeo remembers.

About four years later, he was talking with Ray West, MD, who was then editor of *Alumni Journal*, the publication of the School of Medicine alumni association. The two men talked of the story, and at Dr. West's suggestion, Dr. Yeo decided to investigate further. After some eight years of off-and-on research—running into lots of dead ends—Dr. Yeo published a rich account of the story of Dr. Tatsuguchi in the

Alumni Journal in 1993, the 50th-year anniversary of Attu.

"The story just kept pulling me back to the Church connection, because that is the core of why this story is poignant and gripping," Dr. Yeo says. "The Adventist Church has always been like family."

The amazing circumstances of the story also drove Dr. Yeo's fascination.

"This was a great, big war that engaged practically the whole world, with unimaginable casualties," he says. "And when the dust settled, here you have a doctor on the enemy side who had been killed at the same battle where his classmate fought. Not only were they two alumni, but two classmates who had known each other since undergraduate study."

As even more time passes, this story continues to fascinate. Just recently, for example, Dr. Yeo received a phone call from a stranger in Seattle, wanting to know more about the diary.

What follows is taken from Dr. Yeo's writing and careful research into history and the lives of his fellow alumni.

Tatsy's life and death

His American friends called him "Tatsy." Dr. Tatsuguchi's ties to the United States and the Seventh-day Adventist Church were long and deep. His father had attended Healdsburg College (the forerunner of PUC) in Northern California at the turn of the 20th century. His older brother attended PUC and Emmanuel Missionary College. And then Tatsy also studied at PUC, from 1929 to 1932. Upon the

unexpected deaths of his parents, he returned home to Hiroshima to take care of family affairs. But he came back to the United States in 1933 to study at the College of Medical Evangelists, graduating in 1938.

Dr. Tatsuguchi and his new wife, Taeko Miyake, set sail in the spring of 1939 to return to Japan, where he worked in the Seventh-day Adventist Tokyo Sanitarium. The couple had a daughter, Misako, in 1940. Then in January 1941, Dr. Tatsuguchi was drafted and ordered to report to new quarters on the grounds of the Imperial Palace. It was dreaded news. He could return home only on assigned days. Dr. Tatsuguchi went through officer candidate training and army medical school.

On a rainy day in the fall of 1942, Dr. Tatsuguchi said goodbye to Taeko, who was pregnant again, and his daughter. He was not allowed to tell them where he was going or when he would return. A few months later, in March 1943, the sergeant-major of the Imperial Army was aboard a troop transport en route to Attu. The Japanese had occupied Attu since June of

the previous year.

This small island only measures some 20 miles by 35 miles and features high winds, dense fog, treeless mountains up to 3,000 feet, and bone-chilling cold—even in May, when Attu would become the final resting place for more than 2,000 Japanese.

American intelligence had been aware of the Japanese presence on Attu since the first occupation in June 1942 and planned to continue monitoring the situation until an adequate American force could be gathered to reclaim this piece of United States territory. The first American landing was scheduled for May 7, 1943, but it was postponed to the 11th.

The American strategy was to pinch the Japanese on the island between invading northern and southern forces. The original forecast was that Attu would be delivered within three days. There were 12,000 American troops against approximately 2,300 Japanese. But it took 18 days to defeat the Japanese, who lost all but about 30 combatants. As for the Americans, 549 were killed; 1,148 were

wounded; 1,200 were injured by the cold; 614 were sickened by disease; and 318 suffered accidents.

Dr. Tatsuguchi's diary begins when American forces landed at Massacre Bay.

As Dr. Yeo points out, the whereabouts of the original diary—if it still exists—are unknown. He has seen 13 different versions of the document. Translation and transcription also present opportunities for inaccuracies to arise. The following excerpts are as recorded in a translated version owned by retired First Sergeant Charles W. Laird, Company H, 32nd Infantry, 7th Division of the U.S. Army.

The diary

May 11: Carrier based plane flew over, fired at it. There is a low fog and the summit is clear. Evacuated to the summit. Air raids carried out frequently until 1000. Heard land noise—it is naval gun firing.

May 12: In the night attack we have captured 20 enemy rifles. There is



In this circa 1922 photo, Paul Nobuo Tatsuguchi (far left) is shown as a child with his parents and siblings.

tremendous mountain artillery gun firing. Approximately 15 patients come into the field hospital.

May 13: Continuous flow of wounded to the field hospital.... Enemy strength must be a division. Our desperate defense is holding up well.

May 14: The enemy has a great number of Negroes and Indians.... In a raid I was ordered to West Arm, but it was called off. Just lay down from fatigue in the barracks. Facial expression of soldiers back from West Arm is tense. They all went back to the firing line soon.

May 15: There was an air raid, took refuge in former field hospital cave. The guns of a Lockheed spit fire and flew past our cave.

May 16: At night about 1800 under cover of darkness I left the cave. The stretcher went over muddy roads and steep hills of no-man's land. No matter how far or how much we went, we didn't get to [the] pass. Was rather irritated in the fog by the thought of getting lost. Sat down every 20 or 30 steps. Would sleep, dream, wake up again. Same thing over again. The patient on the stretcher who does not move, is frost-bitten.... The pass is a straight line without width.... Sitting on the butt and lifting the feet, I slide very smoothly and change direction with the sword.... Walking is now extremely difficult from left knee rheumatism which reoccurred on the pass.... By the favorable turn since the battle of East Arm, reserves came back.

May 19: The hard fighting of our 303rd Bn. in Massacre Bay is fierce and it is to our advantage. Have captured enemy weapon and used that to fight. Mowed down 10 enemy coming in under the fog. Five of our men and one medical NCO [non-commissioned officer] died.

May 20: Was strafed when amputating a patient's arm.... Nervousness of Owia,

Commanding Officer, is severe and has said his last words to his NCOs and officers—that he will die tomorrow. Gave all his articles away. Hasty chap, this fellow. The officers at the front are doing a fine job. Everyone who heard this became desperate and things became disorderly.

May 22: Officers and men alike in frost. Everybody looked around for food and stole everything they could find.

May 24: Naval gun fire, aerial bombardment, trench warfare—the worst is yet to come.... Am suffering from diarrhea and feel dizzy.

May 25: No hope for reinforcements. Will die for cause of Imperial Edict.

May 26: Diarrhea continuous, pain is severe, took everything from pills, opium, and morphine, then slept pretty well. Strafing by planes, roof broke through. There is less than 1,000 left from more than 2,000 troops.

May 27: The remaining ration is only for two days. Our artillery has been completely destroyed.... Continuous cases of suicide.... Heard they gave 400 shots of morphine to severely wounded and killed them. Ate half fried thistle. It is the first time I have eaten something fresh in six months, it is a delicacy.

May 28: The last assault is to be carried out. All patients in the hospital were made to commit suicide. Only 33 years of living and I am to die. I have no regrets. Banzai to the Emperor. I am grateful I have kept the peace of my soul which Edict [this word has also been translated Christ, Ehkist, Enkist, and Adict] bestowed upon me. At 1800 took care of all the patients with grenades. Goodbye [Taeko], my beloved wife, who has loved to the last. Until we meet again, grant you God-speed. [Misako], who just became four years old will grow up unhindered. I feel sorry for [Mutsuko], born February

of this year and gone without seeing your father.

After Attu

The Japanese forces made a last desperate attack in the early morning of May 29. What happened next is told in the words of Dr. Whitaker (who has since died, in 1999):

“Dr. Tatsuguchi was killed not far from our aid station. The soldiers recognized that he was a medic and brought me his medical bags, which contained a *Gray's Anatomy* book with Ed Lee's name in it. I subsequently brought it back home and gave it to Ed as a memento.

“What a surprise this whole thing was! I should also point out that besides Tatsu and me, there was a third CME graduate on Attu: Joseph Mudry [Class of 1939. Dr. Mudry did not know Dr. Tatsuguchi personally]. I still have the bags and a copy of the original translation of Tatsu's diary, now yellow and fragile. Time has taken its toll on us all.

“I have seen many subsequent write-ups about Tatsu, most of them inaccurate.”

Back in Japan, Taeko Tatsuguchi worried and prayed. Anxieties rose with the announcement of the loss of Attu, but there was no word about where her husband was. The dreaded news finally arrived in August.

Now the sole parent to her two daughters, Mrs. Tatsuguchi determined to provide the best care and educational opportunities within her meager circumstances. Her parents lived in Hawaii, where her father was a pastor to the Hawaiian Japanese Seventh-day Adventist congregation. She was finally able to return there with her children in 1954. In 1961, she moved to Angwin, California, for her older daughter, Joy Misako, to attend PUC. Then in the mid-1960s, she relocated to Southern California, and her younger daughter, Lori Mutsuko, attended LLU School of Nursing. Now 94 years old, Mrs. Tatsuguchi lives in Los Angeles, California, with Lori Mutsuko. She has four grandchildren. *SCOPE*

Telehealth: miles away but face to face

Health care professionals and educators use telehealth technologies to establish health services and education in outlying communities

AN INTERVIEW WITH W. WILLIAM HUGHES, PhD; BY LARRY KIDDER, MA

W. William (Billy) Hughes, PhD, has recently been named dean of the Loma Linda University School of Pharmacy (see page 24). In his previous role as director of educational support services for the University, he was heavily involved with applying many of the latest technologies to the educational setting. It was in this role that he became a key player in developing telehealth at Loma Linda. In the following pages, he explains the history and process of telehealth in his own words. —LK

Telehealth at Loma Linda University is more than clinical telemedicine; it involves all health sciences that can improve access to health care by providing services to rural America.

All health science professionals— allied health, dentistry, medicine, science

and technology, psychology, marriage and family therapy, public health, pharmacy, nursing—have something to contribute to telehealth.

We prefer the term “telehealth” over telemedicine just to show the extent to which services are available.

The beginnings of telehealth

Some three years ago, consistent with the mission of the University, Dr. Lyn Behrens [president of Loma Linda University Adventist Health Sciences Center, or LLUAHSC] saw Loma Linda as a major player in telehealth.

Dr. Behrens felt that a more concerted effort to utilize telemedicine and telehealth technologies would only serve to strengthen our outreach efforts.

I credit Dr. Behrens for providing

the leadership and focusing the institutional will to propel LLUAHSC to become the telehealth “hub” for Southern California.

The CTEC grant

With the assistance of a California Telemedicine and eHealth Center (CTEC) grant, we launched the Loma Linda University Telehealth Initiative (LLUTHI) and started our journey to become the Southern California regional telehealth hub.

The grant that we were initially awarded was coordinated by Dr. James Kyle, former dean of the School of Public Health, and Paul Simms, former deputy health director for San Diego County. Mr. Simms currently serves as administrative director for the LLUTHI. The original award was for \$400,000 and over the ensuing two years, that amount was supplemented by \$150,000 to support a telemedicine coordinator.

When Dr. Kyle left the University in June 2006, I assumed the role of principal investigator (PI), since I had been contributing to the grant since its inception. Much of the technology that is used for telehealth involves videoconferencing—a technology with which I have familiarity.

The University has enjoyed a long and successful track record in the use of teleconferencing for educational purposes.

In 1994, Dr. Behrens and Jerry Daly, the former director of media services [current assistant vice president for global outreach, LLUAHSC] purchased our initial teleconferencing equipment



Dr. Hughes illustrates the simplicity of the equipment needed to create teleconferencing capabilities used to provide specialty health care for outlying clinics.



W. William Hughes, PhD

as a result of a gift from Tom and Vi Zaparra. Shortly thereafter, we began to offer individual courses. Our first venture was with Atlantic Union College [in South Lancaster, Massachusetts].

Subsequently, we have offered degree and certificate programs to off-campus sites—for example, the physical therapist assistant program at Oakwood College, the occupational therapy assistant program at Fresno City College, and most recently two additional programs at Fresno—the nuclear medicine and radiation therapy certificate programs administered by the School of Allied Health Professions department of radiation technology.

We now have a marriage and family therapy graduate degree program at Canadian University College [in Lacombe, Alberta], a family medicine residency training program at Hanford Central Valley Hospital, and a bachelor's program at Humanitec Rehabilitation College, in Japan.

We have more than 13 years of experience in delivering educational content via teleconferencing. Logistically, we have the details worked out for that form of delivery. So it just seemed natural, since the University had expertise in that area, that we would support the Telehealth Initiative.



A little more than a year ago, the Mobile Telemedicine Vehicle (MTV), part of a joint effort between the U.S. Army and Loma Linda University Medical Center, known as the DISCOVERIES project, was unveiled. The MTV is currently being used in a research project involving a medical clinic in nearby Reche Canyon where study subjects are being remotely assessed by the LLUMC emergency department. Originally designed for assisting with disaster events, the MTV can also provide help in areas where no Internet or phone connections are available, since it maintains connectivity via satellite technology.

Our initial focus is providing access to health care in rural communities in Southern California. In reality however, there are communities just 10 to 15 miles away that, because of limited services and no transportation, also have limited access to basic health care. It is a natural fit for Loma Linda University to offer, through the Telehealth Initiative, access to specialty care for both rural and urban communities.

With our initial grant from CTEC, we identified three hospitals where access to specialty care was not available—although general access was possible. Catalina Island Medical Center, the smallest licensed hospital in the State of California, is one of our partners.

We also have Tehachapi Valley Healthcare District, as well as Ridgecrest Regional Hospital.

It is noteworthy that about two years ago [to the day of this interview], we had our initial dialogue with Ridgecrest Hospital. Roger Berg, their telehealth director, called. We set up a teleconfer-

ence, and as we got into the conversation talking about the technology and what they were seeking from Loma Linda University, the conversation started to move far beyond continuing medical education or the offering of certificate programs.

In other words, the educational thrust for which I thought I was going to be able to provide some support almost immediately turned to requests for clinical services that the Medical Center could provide.

I informed the group involved in the teleconference that I was not in a position to answer those questions. I then called Dr. Behrens and told her we were getting requests for telemedicine and telehealth services from rural health providers. I also told her I thought we needed to send a consistent message to those seeking a telehealth relationship with LLU. In response, Dr. Behrens formed what has come to be known as the telehealth coordinating committee, a group that has oversight for coordinating

all the education, research, and clinical services associated with telehealth. The committee is chaired by Kevin Lang [executive vice president for finance and administration, LLUAHSC]. This was about the time that we were embarking on the first CTEC grant, so the timing was quite appropriate.

A little more than a year ago, the Mobile Telemedicine Vehicle (MTV), part of a joint effort between the U.S. Army and Loma Linda University Medical Center known as the DISCOVERIES project, was unveiled. The MTV is designed to provide emergency telemedicine services at the scene of disasters, such as an earthquake.

The nuts and bolts of telehealth

There are two primary approaches for the delivery of telehealth: “store-and-forward” technology or interactive teleconferencing.

Store-and-forward technology involves the storage and sending of still digital images to remote specialists for diagnosis and interpretation.

For ophthalmology, the sending of retinal images is an important component, particularly for diabetic screening as part of an overall strategy for chronic disease management. CTEC and the UniHealth Foundation each funded an ARIST™ retinal camera for Hanford and Catalina Island respectively.

For dermatology, surface lesions and other skin abnormalities can be digitally photographed, images compressed, and sent as what is commonly called a “jpeg” file. These files are then downloaded at the appropriate clinical department at LLU Health Care for diagnostic viewing and interpretation.

That’s store-and-forward technology. It works well when you have images that do not require a live, interactive video.

The second technology is live teleconferencing. This modality provides the capability for live audio and video connections between what we call a “spoke” site—for example, the rural clinic where individuals seek specialty



A telehealth training facility will be located on the fourth floor of the new Centennial Complex, currently under construction, with the goal of familiarizing the health care professionals of tomorrow with telehealth technologies.

health care—and a “hub” site, such as Loma Linda University.

We connect to our rural partners via a normal Internet protocol (IP), or through Independent Subscriber Digital Networks (ISDN). The absence of psychiatry represents a major unmet need in rural communities—a need that can be met through telepsychiatry or interactive live teleconferencing. Pediatric psychiatry is one of the more popular entry points for deliverable services using teleconferencing. It really doesn’t require any additional technology—just a camera and that face-to-face over a distance interaction.

With the help of Richard Hergert [vice president and chief information officer for Loma Linda University Medical Center] and his staff, we have now connected the Diabetes Treatment Center to the network and are capable of providing multilingual diabetic patient education classes to our rural partners.

There are, of course, more technically sophisticated forms of telehealth that involve peripheral diagnostic instruments that can be connected to the teleconferencing equipment.

We can support electrocardiograms (ECGs), vital signs monitors, spirometry for respiratory function, dermscopes for skin lesions, ear/nose/throat (ENT) scopes, otoscopes, ophthalmoscopes—all

with the ability to connect into the system and provide video and/or data signals from that spoke site back to the hub site, where the signal can be viewed by a health care specialist.

Internal benefits and research efforts

For the institution internally, there’s another opportunity. For example, our ability to connect the urgent care facility on the LLUMC East Campus with the emergency department at the Medical Center allows for rapid access to intensivist and emergency consults—you could eliminate patient transport.

There are other demonstration projects on campus that currently involve telehealth. For example, the DISCOVERIES program connects the emergency department at the Medical Center with a health care facility in Reche Canyon.

The goal of this effort is to demonstrate the impact of providing emergency room services in a skilled nursing facility via telemedicine. This service may reduce unnecessary transport, a benefit of which would be the reduction in patient numbers at our already overcrowded emergency rooms.

There are outcome studies that indicate that telehealth provides a benefit that is both a cost savings and promotes timely access to health care.

Some of the very low bandwidth



Veidy Almaraz stands next to the telemedicine banner in the LLU Faculty Medical Offices telemedicine facility. Ms. Almaraz is the full-time telemedicine coordinator.

home health telemonitoring, particularly with certain chronic diseases, such as diabetes, hypertension, and congestive heart failure, can prevent hospitalizations through scheduled interactions with patients that are at home or in other health care facilities.

Judith Jensen [director of home health and community care coordination services at the VA Loma Linda Healthcare System] is partnering with the LLUTHI to share expertise and lessons learned, including outcome studies that demonstrate health benefits and cost reductions.

A focus on diabetes

In our CTEC grant, we have focused on chronic disease management—particularly diabetes—which we feel is one of the greatest needs to benefit from the LLUTHI. It allows us to combine store-and-forward retinal imaging technology along with patient education, using teleconferencing technology to rural areas where access to health care was not previously possible.

When you consider what it takes for an individual on Catalina Island to come to the mainland to have diabetes education, to catch the ferry, make the trip, to have arranged for transportation on the mainland, go to the clinic, receive training, go back, catch the ferry again—

it consumes an entire day. And that has an associated economic loss for that individual, the family, and the community.

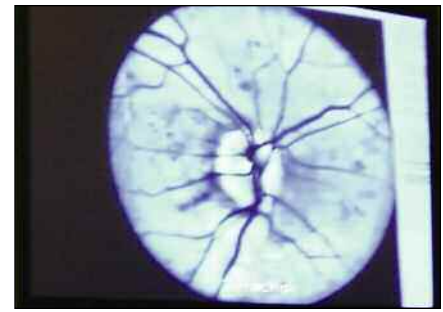
It may be what prompts individuals not to get help, because the process is so laborious in order to make it happen. To be able to provide that type of education—diabetes education—to an individual as close to his or her home as possible, in a familiar setting, is both a savings in time and cost to the individual.

Reimbursement

Of course, one of the concerns is reimbursement. There are many more codes that are now reimbursable through Medicare and Medi-Cal. The California State Legislature passed a bill last fall, proposed by Assemblyman Dave Cogdill [Republican, Modesto] that added store-and-forward techniques to the list of Medi-Cal approved telemedicine procedures.

Traditionally, clinicians have been required to be physically present in the room with a patient in order to charge for a consultation. Unfortunately, most consultations in the past have been denied reimbursement if performed using teleconferencing.

While progress has been made, more legislation needs to be enacted and insurer reimbursement policies rewritten.



Teleophthalmological retinal scanning capabilities are an important component in the monitoring of diabetic patients.

To me, the irony is that health care dollars are stretched so much farther with telemedicine—both for the patient and for the health care provider.

Sustainability

When you look at the hundreds of rural clinics in Southern California, the need is clearly there. Nearby, our mountain hospitals and health care clinics are partnering with us to provide health care services to their communities.

We are interested in going into areas where we know we can have a sustainable operation. Sustainability means more than providing clinical services. It means there is the potential for education—whether that be continuing education, patient education, certificate or degree programs—those are educational offerings that all use similar teleconferencing technologies.

We also feel that research is a very important component. The outcomes research that can be performed has the potential to validate telehealth as a viable method to deliver health care.

The interest and attendance at the American Telemedicine Association is important. It illustrates that it's not just about the technology—it's about the people and their enthusiasm, the changes in legislation, the reimbursement, and the recognition that if we are going to provide truly excellent health care to our underserved populations, it will be through telehealth. *SCOPE*

Newscope

Board of Trustees names new deans

The Board of Trustees recently named Beverly J. Buckles, DSW, chair and professor, department of social work and social ecology, SST, the dean of the LLU School of Science and Technology.

During the same session, the Board named David T. Dyjack, DrPH, as dean of the LLU School of Public Health.

W. William Hughes, PhD, was named by the Board to serve as dean of the the LLU School of Pharmacy during a conference call on January 31.

For the past 14 years, Dr. Buckles has served at Loma Linda University. In 1993, she joined the University as chair for the department of social work and social ecology.

According to Ron Carter, PhD, vice chancellor of academic affairs, LLU, and former dean of SST, Dr. Buckles is a visionary who toils diligently until the work is done.

“She has been one of the finest department chairs that I have ever known,” says Dr. Carter. “She will take charge and move SST strategically into its next developmental stage.”

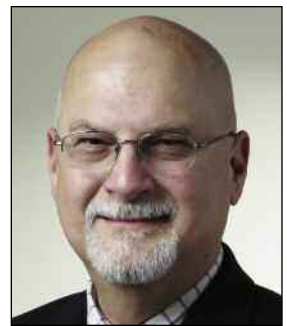
As one of the founders of the LLU International Behavioral Health Trauma Team (IBHTT), Dr. Buckles helps heal wounds of the heart. The interdisciplinary team provides psychological debriefing for the victims of natural or man-made disasters by presenting seminars to the local health professionals living near the disaster site. IBHTT has provided clinical services and training in more than 15 countries.



Beverly J. Buckles, DSW



David T. Dyjack, DrPH



W. William Hughes, PhD

Dr. Dyjack received his undergraduate education in biology from Saint Mary's College of Maryland in 1982; his master of science in public health from the University of Utah, Provo, in 1992; and his doctor of public health in occupational health from the University of Michigan, Ann Arbor, in 1996.

In 1994, Dr. Dyjack was named associate dean for public health practice in the School of Public Health. In July 2006, he was appointed interim dean of the School of Public Health and officially placed in that position by the Board in October of 2006.

Dr. Hughes most recently served as director of educational support services at Loma Linda University. In addition, he is a professor in the LLU School of Science and Technology and an associate professor in the LLU School of Medicine.

Before heading up educational support services, Dr. Hughes served in a number of positions for the LLU School of Allied Health Professions, including as

program director for off-campus programs and basic science education, professor of basic science, and associate dean.

The School of Pharmacy recently graduated its first class of 34 pharmacists with their PharmD degrees and is in the process of seeking full accreditation. As one of only two Seventh-day Adventist schools of pharmacy in the world, and the only Adventist school of pharmacy in the U.S., the School of Pharmacy is already taking a lead role in training Adventist pharmacists for leadership in the field. The incoming class has 65 members.

“We’re now in the process of maturing a strong infrastructure for the School,” Dr. Hughes explains, “which will sustain it through the coming years.”

Dr. Hughes graduated with a bachelor's degree in biological sciences in 1973. In 1974, he completed a master's degree in biological sciences from Pacific Union College, in Angwin, California. He returned to LLU and completed his PhD in biological sciences in 1978.

New LLU Centennial Complex reaches \$40 million milestone

In mid-December, Loma Linda University achieved a significant milestone when gifts and pledges for the new Centennial Complex—currently under construction—passed the \$40 million mark, thus meeting a key qualification for a \$1.5 million challenge grant from the Kresge Foundation.

According to Carolyn Cales, MA, Loma Linda University executive director for special gifts, the challenge grant was achieved four months early. More than 750 individual donors gave gifts and made pledges to this major building project—as did several major foundations.

As construction continues, so also will campaign fundraising efforts to cover building-cost increases beyond original construction estimates.

Raye McAnally Lofgren and Carlton Lofgren, DDS, and Patti Shryock Wal-



Construction has now begun on the Centennial Complex. This picture, taken March 20, shows the beginnings of the south wall.

lace and Carleton Wallace, MD—co-chairs of the campaign for the Centennial Complex—will continue to oversee this continuing fundraising effort.

The Centennial Complex is a high technology, student-oriented facility that will enable “anytime, anywhere” access to a vast array of health professions information. By combining the best in traditional ways of teaching and learning with informational resources that leading-edge

communication technology makes available, the complex will transform the way that LLU delivers health professional education to its students on campus, regionally, and globally.

“The planning and design of the complex comes at a most appropriate time for the University and its students,” says Richard H. Hart, MD, DrPH, Loma Linda University chancellor.

“The complex looks toward an anticipated on-campus enrollment growth of 25 percent, from the current 4,000 to 5,000 students, by the year 2010. Our students are quite adept at using up-to-date communication technology. Therefore, the complex is designed to integrate these skills into the learning process.

“Furthermore, the University serves as the educational hub for the preparation of competent and compassionate health professionals who may work in 500 hospitals and health centers around the globe. As such, Loma Linda receives multiple requests for educational and health care services from many parts of the world, especially remote settings where basic and continuing education in the health professions may not be readily available.

“Growth, technological innovation, and global connectivity have been the guiding themes for the design of the



School of Pharmacy white coat ceremony

The LLU School of Pharmacy's 63-member class of 2010 receives white lab coats and pins during the annual white coat ceremony, held on January 21 in the Loma Linda University Church.

LLUMC unveils new construction project

On December 13, Loma Linda University Medical Center announced plans for a construction project that will provide a new building to house the International Heart Institute and establish two state-of-the-art centers for imaging, gastrointestinal, and pulmonary services.

The new building will allow for expansion of services and ease of access to accommodate the rapidly growing population of the Inland Empire. The facility will also allow for the expansion of the Cancer Institute within the current Schuman Pavilion, and is in alignment with the overall strategic plan to allow LLUMC to continue providing service excellence and clinical leadership in health care for the residents of the Inland Empire.

"This is a very important part of expanding our services," says Ruthita Fike, MA, CEO of Loma Linda Univer-



(From left) Jesse Mock, vice president for LLUMC facilities; Danny Fontoura, MBA, senior vice president, LLUMC; Lowell Cooper, MPH, chair, Board of Trustees; Roger Hadley, MD, dean, School of Medicine; and Kevin Lang, MBA, chief financial officer, LLUAHSC, watch as Ruthita Fike, MA (left), CEO, LLUMC, and B. Lyn Behrens, MBBS, president & CEO, LLUAHSC, unveil the new sign marking the ambulatory pavilion site.

sity Medical Center.

The proposed pavilion will be built east of the Schuman Pavilion on the northeastern corner of the Medical Center campus. It will encompass 142,000 square feet among four floors, with total project costs estimated to be \$96.2 million. Construction is expected to take between 18 and 24 months once

city approval and appropriate permits are in place. Upgraded parking access will be developed to coincide with the project.

"We really do want to make accessibility and convenience hallmarks of this institution," says Danny Fontoura, MBA, senior vice president of LLUMC. "We know parking is going to be a cornerstone of this project."

LLUAHSC vice president steps down

Early in January, W. Augustus Cheatham, MSW, vice president for public affairs, Loma Linda University Adventist Health Sciences Center, experienced symptoms that caused him to seek medical attention. A small brain tumor was identified and removed on January 10.

Mr. Cheatham has expressed appreciation to the entire Loma Linda University Medical Center and East Campus Hospital staff for the wonderful care he received while hospitalized. He is currently recuperating at home.

Although he has responded well to the surgery and rehabilitation treatments, and continues to improve, in a letter dated April 2 to B. Lyn Behrens, MBBS, president of LLUAHSC, Mr. Cheatham indicated, pursuant to input from clinicians and discussions with

family, he has come to the conclusion that he must step down from responsibilities effective July 8.

President Behrens has indicated that Mr. Cheatham's letter of resignation has been accepted with regret and understanding of the circumstances that have necessitated his decision, and with the deepest of appreciation for his many accomplishments over the past 22 years.

"We want to honor Mr. Cheatham," says Dr. Behrens, "and we will build on his legacy as we move to select a successor."

She further requests that all remain prayerful for the continued improvement of Mr. Cheatham's health, and for God's blessing on his family.

A more in-depth report about Mr. Cheatham's years of service will appear in a future issue of *Scope*.



W. Augustus and Ida Cheatham

Children's Hospital hosts KFRG/Stater Bros. bicycle giveaway

Approximately 4,500 families and their children attended the fourth annual Loma Linda University Children's Hospital bicycle giveaway held on Sunday, November 12, 2006. The event was held at the Arrowhead Credit Union Park in San Bernardino.

Eight hundred fourth-graders and their families were invited to attend the bicycle giveaway hosted by KFRG radio and Stater Bros. Markets. The fourth-grade recipients of the bicycles and safety helmets were children who had never had a bicycle and were recommended by their school teachers.

Inland Empire radio listeners donated a total of \$507,175 for the treatment of cancer patients at Loma Linda University Children's Hospital.

For each contribution of at least \$200, a Kent bicycle and helmet was purchased from Toys 'R' Us. The effort made possible the obtaining of the bicycles for fourth grade students who live in the Children's Hospital service area of San Bernardino, Riverside, Inyo, and Mono counties.

One of the donors, Mike Adams from Anaheim, stood quietly next to a bicycle that his donation had helped make possible for a child.

Mr. Adams said he had donated to the KFRG radiothon in honor of his son, Mike Jr., a 4-year-old child who drowned in a friend's swimming pool in 1994. "He would have liked this," Mr. Adams said. "He liked to ride his bicycle." Mr. Adams plans to donate to the radiothon again next year.



A day with "Dr. Venom" was a \$24,000 hit during the live auction. In the photo above, Sean Bush, MD, and his wife, Ame, hold their snake Samantha, as Sebastian Barroso, a former patient and star of the Children's Hospital gala video, pets her.

Loma Linda University Children's Hospital gala surpasses goal of \$500,000

Guests, friends, and local business supporters of Loma Linda University Children's Hospital raised \$523,370 at the 14th annual Loma Linda University Children's Hospital Foundation gala held at the Riverside Convention Center on Sunday, February 25.

Approximately 850 individuals attended the "It's a Jungle Out There" gala sponsored by the San Manuel Band of Mission Indians.

"Each year we are privileged to select a Children's Hospital unit to benefit from your caring and generosity," said Larry Sharp, chair of the LLUCH Foundation Board, in his introductory remarks. "Tonight, all proceeds will support the pediatric trauma services, a department that treats children who are facing the most devastating injuries."

Proceeds from the evening were designated for the pediatric trauma services at Loma Linda University Children's Hospital. Last year, nearly 5,000 children received care at Children's Hospital.

"While the leading causes of

injury are motor vehicle accidents and falls," says Donald Moores, MD, chief, division of pediatric surgery at Loma Linda University Children's Hospital, "children need trauma care for a variety of reasons including near drowning, child abuse, and snake bites."

Loma Linda University Children's Hospital is one of only 13 Level I trauma children's hospitals in the country. Loma Linda's pediatric trauma team serves the four county area of San Bernardino, Riverside, Mono, and Inyo counties and provides medical care for nearly 5,000 children annually.

Several awards were presented during the evening. Receiving the Shirley N. Pettis Award was Arlene Willis Lewis, a lifetime resident of San Bernardino County, and chief of staff and spouse to Congressman Jerry Lewis, who represents California's 41st Congressional District.

Receiving the 2006 Loma Linda University Children's Hospital Foundation Hometown Heroes Award were Debi Faris-Cifelli and Bernadette Gal-

LLU professor shows that pomegranate juice may reduce risk of Alzheimer's disease

When his grandfather passed away from Alzheimer's disease, Richard Hartman, PhD, assistant professor of psychology, School of Science and Technology, wanted to make a difference. "It was devastating to see the effects," he recalls.

Dr. Hartman's experience with Alzheimer's may help others fight off the disease. He found that a daily glass of pomegranate juice could halve the build-up of harmful proteins linked to Alzheimer's disease. In fact, his study has shown that pomegranates work just as well as pharmaceutical medicines.

"This study is the first to show beneficial effects (both behavioral and neuropathological) of pomegranate juice in an animal model of Alzheimer's disease,"



Richard Hartman, PhD, assistant professor of psychology, SST, is currently studying the effects of pomegranate juice and A-beta antibodies on brain damage caused by stroke or trauma.

says Dr. Hartman, researcher and lead author of the study. He also collaborated with Washington University researchers on this project.

The study began with transgenic mice predisposed to develop Alzheimer's-like pathology and symptoms. At a young age, the mice were split

into two groups—half received water with added pomegranate-juice concentrate, and the control group received drinking water with the same amount of sugar as the juice.

The mice drank an average of 5 milliliters of fluid a day, which is roughly equivalent to a human drinking one to two glasses of pomegranate juice a day.

The learning and memory abilities of the mice were tested in the Morris water maze, which required the animals to swim and find a submerged platform in a pool of water.

The results are significant. After six months, the pomegranate juice-treated mice learned water maze tasks more quickly and swam faster; and the mice that drank the pomegranate juice had 90 percent less beta-amyloid plaques in the hippocampus of their brains.

Pomegranates contain very high levels of polyphenols (an antioxidant phytochemical that tends to prevent or neutralize the damaging effects of free radicals) as compared to other fruits and vegetables.

The study, titled "Pomegranate juice decreases amyloid load and improves behavior in a mouse model of Alzheimer's disease," is featured in the December 2006 journal *Neurobiology of Disease*.



'Big Air Kids Fair' visits LLUCH

Motocross freestyle riders Jeff Tilton (left) and Ronnie Renner, two of the most talented freestyle riders in the world, perform for patients and staff at Children's Hospital on January 17. The Big Air Kids Fair is now in its fifth year. After the jump demo, the riders split into two groups and toured the hospital, distributing loads of shirts, hats, pajamas, toys, and other products generously donated by motorcycle industry leaders.

What is a net worth? SIMS provides bed nets to save lives

Every 30 seconds an African child dies of malaria. For many children and families in Africa where malaria is a leading cause of death, a net is worth a life. Sleeping under an insecticide-treated bed net (ITN) is one of the most effective and inexpensive ways to prevent malaria. An ITN costs approximately \$5. However, that is beyond reach for many who need it the most. For the past two years, Students for International Mission Service (SIMS) has collected donations for its mosquito bed net project.

In December of 2005, SIMS raised almost \$30,000 for insecticide-treated bed nets that were distributed during a health fair in Batouri, Cameroon. In partnership with local health leaders, the SIMS team trained and educated local



A boy in Batouri, Cameroon, happily displays his insecticide-treated bed net that he received after attending the SIMS health fair in December 2005.

health leaders, and together they put on the city's first health fair. Health education topics included malaria prevention, nutrition, maternal/child health, oral health, and HIV/AIDS prevention. After attending all of the lectures, participants were given a free ITN.

In December of 2006, empowered health leaders in Batouri used the edu-

cation and training they received to put on the city's second health fair.

If you're interested in providing a \$5 donation that will help save a life, send your tax-deductible gift to SIMS, Loma Linda University, Cottage 80, Loma Linda, California 92350. For more information, please contact SIMS at (909) 558-8089 or by e-mail at <sims@llu.edu>.

Public health collaborates with county to train food handlers

The office of public health practice and workforce development at LLU School of Public Health is partnering with the County of San Bernardino to reduce the risk of catching food-borne illnesses at restaurants.

The office duplicated 7,500 copies of an instructional DVD for training food workers produced by the San Bernardino County Department of Public Health's division of environmental health services.

"This type of activity helps us fulfill our mission of promoting health, reducing illness, and educating the people of our county," says David Dyjack, DrPH, dean, School of Public Health. "This is an example of a public/private partnership that benefits the citizens of San Bernardino."

The DVD is part of an effort by San Bernardino County to better enforce

compliance with applicable food-handling law. The new option makes more accessible the necessary training to obtain a food handler's card.

In the past, food workers have only had the option to attend a class in person at one of six training facilities in the county. The training is also now available online, and the county is adding more testing centers, as well.

Within six months, all food establishments in the county will have received the DVD, and the county's environmental health inspectors will be verifying 100 percent compliance with county code requiring all food handlers to have a current food handler's card within 14 days of employment in San Bernardino County.

"The protection of public health is directly related to the safe food handling practices of employees," says Terri Wil-

liams, REHS, of the county's Department of Public Health.

The School of Public Health is also helping the California Department of Health Services with a training project. The School is reproducing notebooks of written materials that the California Department of Health Services will use to train environmental health leaders on new legislation that takes effect July 1, 2007. The leaders will then return to their respective offices and train the health inspectors in California's 58 county and four city health departments.

The Centers for Disease Control and Prevention funds LLU School of Public Health as one of five Regional Academic Environmental Public Health Centers in the nation. These university-based centers provide technical resources to any environmental health program within their respective regions.

LLBN broadcast coverage now spans 90 percent of world

Loma Linda Broadcasting Network (LLBN) launched its signal on global satellite Thaicom-5 in November 2006. With this new signal, LLBN now reaches Africa, Europe, Asia, and Australia—more than 90 percent of the world's population.

In addition, LLBN is reached by satellite throughout North and South America.

"As many of you know, LLBN has gone from a few hours a week of broadcasting the services of Loma Linda University Church on a local cable channel to reaching thousands in the Americas through the direct-to-home satellite AMC-4, cable headends, and other private low/high power television and radio

stations," says Ganim Hanna, LLBN chief executive officer. "Plus, many other viewers worldwide use our Internet video streaming services. With Thaicom-5, millions more around the world can be reached. Negotiations are currently under way for distribution in Taiwan, Southeast Asia, the Middle East, and parts of Africa."

Going global is a big leap of faith for LLBN, which is run entirely on freewill donations of money and labor, according to Mr. Hanna. "This new venture, including air time and other current operational costs, will bring our budget to approximately \$2 million annually.

"As a 100 percent viewer-supported network, we need your

prayers and partnership to reach the world with the message of hope, health, and healing."

Through the use of more satellites, LLBN is now a worldwide network available 24 hours per day and reaching 194 countries—and the number of nations reached is expected to grow in the near future.

LLBN's range of programming is growing. Along with several new spiritual programs, LLBN is working with Loma Linda University Medical Center and Loma Linda University to bring new programs.

Loma Linda Broadcasting Network's website may be found at <www.llbn.tv>.

Assemblyman addresses issue of premature births in the Inland Empire

On November 28, elected officials and community leaders of the Inland Empire saw firsthand how premature birth affects a newborn as they toured the regional tertiary neonatal intensive care unit (NICU) and new mother-baby unit at Children's Hospital. The NICU tour was presented by the March of Dimes Inland Empire division, LLU Children's Hospital, and Assemblyman Bill Emmerson in an effort to bring attention to the growing crisis of premature birth.

In California, one in ten babies (52,800 babies annually) are born premature. In half those cases the cause is unknown. In 2004 and 2005, more than 7,000 babies (or 11 percent of live births) were born premature in San Bernardino County alone.

Premature birth is now the number one cause of newborn death and a major cause of serious health problems. The national total for hospital charges for pre-

mature and low birth weight babies were estimated at \$18.1 billion by the March of Dimes in 2003. That figure is almost half the total costs for all births in the same year.

Many of these "preemies" suffer lifelong disabilities, which add even more to health and education costs—not

to mention the pain and suffering these babies and their families experience.

The March of Dimes and Children's Hospital are taking the lead in the Inland Empire to address issues around the capacity to care for an increasing number of babies being born too soon, and to better serve families in this area.



Winter snow storm dusts Loma Linda

A winter storm hit Loma Linda University and Loma Linda University Medical Center with a coat of snow on Friday, January 12. Pictured above are Loma Linda University Medical Center and Loma Linda University Children's Hospital.

Center for Christian Bioethics presents new show on the ResearchChannel

Loma Linda University's Center for Christian Bioethics was featured on the ResearchChannel, a nonprofit media and technology organization that connects a global audience with the research and academic institutions whose developments, insights, and discoveries affect our lives and futures.

The show, "Addressing Medical Errors: Shifting the Professional Paradigm to Promote Patient Safety," was broadcast on November 20.

"One of the main functions of our center is to educate the academic community on issues in bioethics," says Mark Carr, PhD, director, Center for Christian Bioethics. "Through our Health and Faith Forum we have done an outstanding job of this for many, many years here on our LLU campus."

According to Dr. Carr, when the idea presented itself that the center could have these sessions broadcast via the ResearchChannel to millions of homes across the country, the center thought it was a great opportunity.

"On the ResearchChannel we have tremendous exposure via cable TV and Internet access," he says.

"We find ourselves in some very good company in terms of research-oriented universities in America who also broadcast on the ResearchChannel."

Johns Hopkins University, the University of Washington, and the Library of Congress are just a few of the institutions whose programs are featured on the ResearchChannel.

More than 70 institutions participate as members and affiliates, and that number continues to grow.

Through cable and satellite distribution, the ResearchChannel is available to more than 22 million U.S. households.



Sompon Wanwimolruk, PhD, professor of pharmaceutical sciences, LLU School of Pharmacy, conducts field work on Ross Island in Antarctica in 1998.

School of Pharmacy professor conducts research on penguins in Antarctica

A professor in the Loma Linda University School of Pharmacy is currently studying Antarctica penguins.

Sompon Wanwimolruk, PhD, professor of pharmaceutical sciences, has already completed and published one study, and he is in the process of applying for further funding of continued study of the Adélie penguins, which live in several colonies on Ross Island in Antarctica.

Dr. Wanwimolruk is particularly interested in studying the levels of a superfamily of enzymes, known as cytochromes P450, found in the liver.

These enzymes are important for metabolizing—or breaking down—xenobiotics, such as drugs, environmental pollutants, and chemical carcinogens.

A paper, titled "Characterization of CYP1A enzyme in Adélie penguin liver," was previously published in the journal *Comparative Biochemistry and Physiology* and online at Elsevier's ScienceDirect website. This was actually the third paper published by Dr. Wanwimolruk on his penguin research.

This earlier study examined 10 penguin livers obtained from adult birds who

died of natural causes—most of them probably killed by skuas, large predatory seabirds.

Cytochromes P450—otherwise known as CYP enzymes—are found in the liver and help to metabolize various toxins produced by the body or taken in from the external environment.

"CYP enzyme levels found in the liver can be used as a biomarker for the levels of pollution to which a species has been exposed," says Dr. Wanwimolruk. "In the past, very little attention has been given to CYP enzyme levels in wild animals."

Scientists are always looking for ways to measure the levels and effects of various pollutants on the earth's inhabitants. The increase in CYP enzyme levels in the penguin livers is one more indicator of exposure to environmental contaminants.

Dr. Wanwimolruk hopes his research will provide new insight into the ability of the penguins, other wildlife, and even human beings to cope with dangerous and growing environmental pollution in the future.

LLU students host Celebration health fair for community

A student-initiated and student-run community service program called the Healthy Neighborhoods Project (HNP) hosted the first Healthy Neighborhoods Celebration health fair since 2002.

On Sunday, October 8, the HNP sponsored a community-focused health fair at SACHS–Norton on East 3rd Street in San Bernardino.

The community was invited to take part in screenings and awareness exhibitions on breast and skin cancer, diabetes, immunizations, obesity, dental health, and child safety, among others.

The health professional students at LLU have a long-standing involvement in the Norton Neighborhoods, a largely uninsured and medically underserved population in San Bernardino.

The health fair initially began in 2001 as part of a “Caring for Communities” grant by Pfizer/AMA that two medical students received to begin the Community Kids Connection tutoring/mentoring program. The health fair and a race were supposed to be the fundraiser to keep the



Maryann Bautista with her son Jose, from San Bernardino, gets her blood pressure taken by Lisa Turner, a physician's assistant at LLUMC.

tutoring/mentoring program going. The health fair and race continued for two years, then in 2003, the event was cancelled due to the fires that ravaged the Inland Empire.

This year, under the direction of Leslie Hsu, a fourth-year medical student and the health fair director, and with sponsorship from LLUMC–East Campus's PossAbilities program and the Inland Empire Health Plan, the health fair was resurrected with many student

booths and community booths for educational purposes for the San Bernardino community.

Besides the health fair, the mentoring and academic tutoring programs that are part of the Healthy Neighborhoods Project give LLU students the opportunity to form ongoing friendships with local children and parents.

The mentoring programs are student-initiated and student-run and are based in the School of Medicine.

Occupational therapy program announces online doctoral program

Beginning in July 2007, the LLU School of Allied Health Professions department of occupational therapy will launch its online doctoral program.

The online degree program received accreditation in December 2006 from the Western Association for Schools and Colleges.

“The flexibility of our online program is designed to fit the busy lives of working occupational therapists,” according to Heather Javaherian, OTD, OTR/L, assistant professor and director of the occupational therapy doctoral program, “helping to meet the ever-changing technological demands of society.”

The coursework includes an emphasis on spirituality, diversity, critical reasoning, advocacy, participation, education, and independent research, says Dr. Javaherian.

Graduates from the program will be prepared to enter academia; conduct research; develop, implement, and assess innovative programs; influence public policy, and experience personal as well as professional growth in the spirit of Loma Linda University.

“Our online community will foster learning and professional growth,” Dr. Javaherian continues, “through creative learning experiences, critical reflections,

community, and in-depth discussions.”

The program's capstone is a 16-unit professional rotation designed by the individual students and approved by the doctoral committee.

“Our faculty envisions the rotation,” Dr. Javaherian explains, “as a way of allowing students to express their creativity, explore new areas of practice, and engage in innovative research and community program development.”

For more information, visit <www.llu.edu/llu/sahp/ot/doc torate.html>, contact Dr. Javaherian at <hjavaherian@llu.edu>, or call (909) 558-4628.

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