

Transplant Update

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Baylor to Offer Living Donor Liver Transplants

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Machine Perfusion of Donated Kidneys Can Increase Function and Graft Survival

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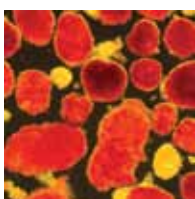
The results of an international randomized, controlled study-published in the *New England Journal of Medicine* in January 2009-shows machine perfusion of donated kidney can have a significant impact on graft survival and function and may deserve more widespread use.



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Baylor to Offer Living Donor Liver Transplantation

Living donor liver transplantation can be an alternative to deceased donor liver transplantation for many patients on the waiting list. The ideal candidates are patients who foresee a long wait on the deceased transplant list and experience complications of liver disease, such as ascites and encephalopathy, and patients who have been diagnosed with hepatocellular carcinoma.

The donor must be emotionally related to the recipient, between 18 and 60 years of age, in good health and of compatible blood type. The donor undergoes a meticulous and comprehensive evaluation process to provide for the safety of the donor operation. In the procedure, the entire diseased liver is removed from the recipient, and in its place, half of the donor's liver is transplanted into the recipient. Within approximately a month, the partial liver in both the donor and recipient grows back to near-full volume.

The donor operation is called a hepatectomy, and is considered a major abdominal surgery. In all aspects of donor care, from the evaluation process to the surgery, hospital stay and recovery phase, the donor is cared for by handpicked teams from the experienced

Baylor transplant staff for all parts of the procedure and care to ensure safety and advanced care. A donor advocate team stays close to the donor during each phase of the donation process.

The outcomes for patients receiving a living donor liver transplant are equal to patients receiving a liver transplant from a deceased donor. Other advantages of living donor liver transplantation are decreased time to transplantation and a surgery that can be scheduled according to donor and recipient needs.

The same quality of care and organization that has made the transplant centers of the Annette C. and Harold C. Simmons Transplant Institute among the world's leading transplant centers is the foundation of the living donor liver transplant program.

“With living donor liver transplantation, there is the advantage of speed and timing,” said James Trotter, M.D., medical director of liver transplantation at Baylor University Medical Center at Dallas. “Unlike a conventional transplant, you can schedule the procedure and do it quickly since the donor is available, in essence, on demand. Therefore, the patients who benefit the most from a live donor liver transplant are patients with an obvious urgency for transplant whose prospects for imminent deceased-donor transplantation are small.

“However, the procedure is not without downsides, especially to the donor. The risk to the donor of a partial liver, who must undergo a major abdominal surgery, is higher than to someone undergoing a laparoscopic nephrectomy. There is a small chance of minor complications and about a 2 percent risk of more serious complications.”

Quick Facts

- Over 25 years ago, Baylor pioneered the first liver transplant program in the Southwest.
- One of three programs in the nation to perform more than 3,300 liver transplants.*
- Baylor's expertise in the areas of hepatitis B and C is internationally renowned.

* Volumes based on liver transplants at Baylor University Medical Center and Baylor All Saints Medical Center



Machine Perfusion of Donated Kidneys Can Increase Function and Graft Survival

Although machine perfusion of kidneys from deceased donors has been available for many years, the technique has not become the gold standard for preservation in the transplant community.

The results of an international randomized, controlled study—published in the *New England Journal of Medicine* in January 2009—shows it can have a significant impact on graft survival and function and may deserve more widespread use.

The study looked at 359 organ donors who had two kidneys available for transplantation. One kidney from each donor was randomly assigned to cold storage and the other to machine perfusion. Recipients were followed to measure immediate function of the kidney, how fast creatinine fell after transplant and one-year graft survival, among other indicators.

One-year graft survival was 90 percent for kidneys kept in cold storage and 94 percent in those that underwent machine perfusion.

“This is a statistically significant benefit,” said Larry Melton, M.D., Ph.D., FACP, medical director of kidney/pancreas transplantation at Baylor University Medical

Center at Dallas. “We only need a 10 percent improvement to reach 100 percent one-year graft survival. The difference going from 90 to 94 percent is almost half of what we need to reach this goal.”

In the study, machine perfusion also significantly reduced the risk of delayed graft function (DGF). DGF occurred in 20.8 percent of the machine-perfusion group compared with 26.5 percent in the cold-storage group.

The incidence of functional DGF, defined as the absence of a decrease in the serum creatinine level of at least 10 percent per day for three consecutive days in the first

week post-transplant, was 22.9 percent with machine perfusion and 30.1 percent with cold storage preservation.

Baylor All Saints Medical Center at Fort Worth has used machine perfusion on almost every kidney graft received for transplant for several years, and Baylor Dallas is increasing use of this preservation technique.

“Our goal is to transplant a donated kidney within about 24 hours,” Dr. Melton said. “The longer the kidney has been out of the donor, the more important it is that it be pumped. We think we may see better results with machine perfusion.”

Quick Facts

- With more than 3,100 kidney transplants performed, our kidney and kidney/pancreas program is one of the largest in Texas.*
- According to the United Network for Organ Sharing (UNOS), survival rates for Baylor kidney recipients exceed the national and state averages.

* Volumes based on kidney transplants at Baylor University Medical Center and Baylor All Saints Medical Center.



Kidney

Pancreas After Kidney Transplant Offers Distinct Advantage

For some patients with type 1 diabetes and end-stage renal disease, pancreas after kidney transplant (PAK) may be more advantageous than the more commonly performed simultaneous pancreas kidney transplant (SPK).

PAK is typically performed when a patient with diabetes-related kidney failure receives a living donor kidney, and then later wishes to receive a pancreas transplant. Kidneys from a living donor function better and last longer than grafts received from a deceased donor. A subsequent pancreas transplant offers the opportunity to come off insulin. In addition, the new pancreas protects the existing kidney graft from the ravages of continued diabetes and prolongs the kidney's survival.

According to the Scientific Registry of Transplant Recipients database, the success rate of pancreas-after-kidney transplant continues to improve. One-year pancreas graft survival increased from 76.5 percent in 2005 to 81.9 percent in 2009.

Quick Facts

- First facility in the Southwest to be approved by the American Society of Transplant Surgeons as a surgical training program in pancreas transplantation.
- Pancreas patient survival rates at Baylor University Medical Center and Baylor All Saints Medical Center exceeded the national average for one year survival.

PAK is now routinely offered at both Baylor University Medical Center at Dallas and at Baylor All Saints Medical Center at Fort Worth. Richard Ruiz, M.D., a transplant surgeon on the medical staff at Baylor Dallas and Baylor Fort Worth and surgical director of pancreas transplantation, said the procedure should be considered more frequently.

“Many patients have loved ones who want to give them a kidney, which makes PAK a distinct and desirable alternative,” he said. “A kidney from a living donor is the gold standard in terms of function. When they later receive a pancreas from a deceased donor, their diabetes is cured.”

PAK is a shorter operation than SPK, and the patient is not in a uremic state at the time of transplant. Since the patient is already on immunosuppression as a result of the kidney transplant, there is no need for additional anti-rejection medications.

“Our criteria [for PAK] are essentially the same as for an SPK candidate, other than we wait a minimum three months after someone has had a kidney transplant to perform the ensuing pancreas transplant. We want to make sure the kidney is functioning really well.” Dr. Ruiz said. “We have been very pleased with this addition to our transplant offerings.”



Baylor Team Figures Prominently at International Islet Cell Transplant Meeting

A team of transplant surgeons and research scientists from Baylor University Medical Center at Dallas and Baylor All Saints Medical Center at Fort Worth were key participants at the International Pancreas and Islet Transplant Association (IPITA) meeting, held June 1–4 in Prague, Czech Republic. The meeting drew 425 physicians and scientists from around the world.

The IPITA conference, which is held every other year, is the preeminent meeting for islet cell transplant surgeons and researchers. IPITA is a subgroup of the International Transplantation Society.

The Baylor team consisted of Marlon Levy, M.D., surgical director of transplantation at Baylor Fort Worth and physician on the medical staff at Baylor Fort Worth and Baylor Dallas, Shinichi Matsumoto, M.D., Ph.D., director of the Islet Cell Laboratory at Baylor Fort Worth, Bashoo Naziruddin, Ph.D., director of the Islet Cell Laboratory at Baylor Dallas and Morihito Takita, M.D., post-doctoral fellow at Baylor Research Institute, Fort Worth.

Dr. Matsumoto chaired a scientific session

and delivered an invited lecture. Dr. Levy was the senior author of five presentations. Dr. Naziruddin gave one oral presentation, and Dr. Takita presented two posters.

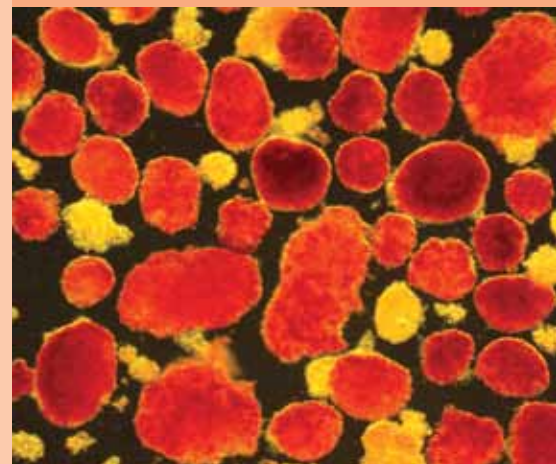
“This is the premier meeting for anyone working in the field of islet cell transplantation,” Dr. Naziruddin said. “It is vitally important that we attend the meeting, as well as present and publicize our efforts to the islet cell transplant community. Baylor is now a well-recognized clinical and research center in islet cell transplantation. All of our presentations were very well received.”

As a result of the meeting, transplant groups from around the world have expressed interest in collaborating with Baylor on several research studies.

“This is the fourth time we have attended the IPITA meeting, and we continue to make new contacts with other researchers in the industry,” Dr. Naziruddin said. “It’s important that we educate ourselves on what others are doing in the field, and apply their best practices to our own work.”

Quick Facts

- North Texas’ first islet cell transplant.
- Baylor’s islet cell laboratory is one of only a few in the country to process cells for transplantation.
- Baylor achieves 100 islet cell isolations.



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LVADs Allow Some Patients to Recover Heart Function

For a very small number of patients with heart failure, implantation of a left ventricular assist device (LVAD) may be a temporary measure. Approximately 3 to 5 percent of all patients who receive an LVAD eventually recover.

According to Shelley Hall, M.D., a cardiologist on the medical staff of Baylor University Medical Center at Dallas and medical director of the heart failure and cardiac transplant program, those individuals most likely to recover heart function are those who experience acute onset heart failure with rapid deterioration.

“Patients with heart failure as a result of viral myocarditis, peripartum or post-partum cardiomyopathy or idiopathic cardiomyopathy are more likely to recover with the assistance of an LVAD,” Dr. Hall said. “Patients with heart failure due to a heart attack or ischemic cardiomyopathy do not.”

While it is not completely clear, Dr. Hall said physicians believe that use of an LVAD is effective in the same way that starting medical therapy quickly increases the likelihood of recovery.

“The sooner we can rest the heart muscle in some way, either mechanically or by medications that block the stimulatory nerves and hormones that make the disease worse, then a patient has a better chance of recovery,” she said.

At Baylor Dallas, two patients with post-partum cardiomyopathy recovered enough ventricular function to have their LVADs explanted. One patient was on the LVAD for 14 months, and the other was supported by the LVAD for more than two years. Because the risk for cardiomyopathy remains high, both patients will take medication for the rest of their lives.

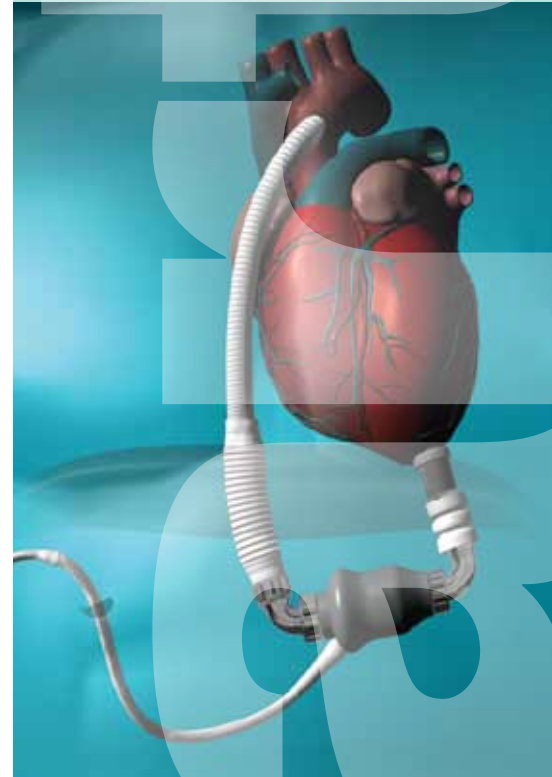
“Cardiomyopathy during pregnancy can be hard to diagnose because virtually every woman in her third trimester experiences shortness of breath, tachycardia and swelling in the lower extremities,” Dr. Hall said. “If symptoms are extreme or out of proportion to what would normally be expected, further evaluation of the patient by a cardiologist may be indicated.”

Dan Meyer, M.D., surgical director of the heart and lung transplantation program at Baylor University Medical Center at Dallas, a collaboration with the University of Texas Southwestern Medical Center, said LVADs are increasingly being considered as the first-line treatment for younger patients with heart failure who have failed medical therapy.

“The improvements in technology are quite exciting. Today’s LVADs can last five to 10 years before a patient even needs a transplant or LVAD exchange,” he said. “We will be looking at whether more patients can be explanted over time by optimizing medical therapy.”

Quick Facts

- The VAD program at Baylor Dallas was the nation’s first to receive the Gold Seal of Approval from the Joint Commission.
- The Baylor/UTSW heart transplant program ranks above the national average for one year and three year patient survival statistics.



A New Look at Extracorporeal Membrane Oxygenation

Extracorporeal membrane oxygenation or ECMO is a mechanical support system that increases the oxygen in the blood and removes carbon dioxide in patients with acute respiratory failure.

ECMO has been available for more than 30 years. Although the initial studies revealed improvement in gas exchange, there was not a significant benefit in mortality in comparison to conventional therapy. However, over the last few years with improvements in ECMO technology and a better understanding of the indications for its use, ECMO has been shown to improve survival in patients with severe respiratory failure.

There are two types of ECMO: veno-venous and veno-arterial. In veno-venous circulation, blood is taken from a major vein, most commonly the femoral vein, and circulated through an oxygenator and then returned to a central vein, usually the internal jugular. In that process, oxygen is added, and carbon dioxide is removed.

In veno-arterial circulation, blood is extracted from a large central vein, oxygenated and returned to the arterial system. Veno-arterial ECMO may be used for patients with cardiac failure, severe cardiogenic shock or when patients cannot be weaned from cardiopulmonary bypass after cardiac surgery.

“ECMO is best utilized in those patients with acute respiratory failure as short-term support while the acute lung injury resolves,” said Randall L. Rosenblatt, M.D., FACP, FCCP, medical director of lung transplantation and chief of pulmonary and critical care at Baylor University Medical Center at Dallas. “Its primary indication now is for temporary life support for patients who have a potentially reversible acute respiratory condition and have failed conventional therapy, even though ventilatory settings have been optimized.”

Dr. Rosenblatt said ECMO has been proven to be helpful in patients who developed the H1N1 flu and then developed acute respiratory distress syndrome.

ECMO also may be used as a bridge to lung transplantation for those patients with end-stage lung disease who deteriorate while waiting for a lung. After lung transplantation, ECMO may be used as well for patients who have primary graft dysfunction and need temporizing help until the lung begins to function.

Quick Facts

- Dallas' first single and double lung transplant.
- Dedicated nurses on call 24 hours a day, seven days a week for the management of an advanced lung disease patient.



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Baylor Charles A. Sammons Cancer Center at Dallas

Join us for a review of therapeutic interventions for cancer of the esophagus, stomach, and pancreas, with special emphasis on minimally invasive techniques.

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Herb Zeh, MD, PhD “Robotic Whipple Procedure”
Director of the Pancreatic Center
Surgical Oncologist, University of Pittsburgh Medical Center

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