

Innovation characterizes pediatric intestinal transplant program



Transplantation of the intestine, a relatively rare procedure, is one of the most challenging types of organ transplantation. UCLA's Pediatric Intestinal Transplant Program, established in 1991, was one of the first in the nation to treat children and adults who require transplantation of the intestine alone, combined liver and intestine or other multivisceral transplantation. Today it is one of the largest programs in the world and is regarded as a leader in the development of innovative pre- and post-transplantation care as well as in the treatment of intestinal failure and rehabilitation.

Treating intestinal failure

The most common cause of intestinal failure in children is short bowel syndrome, a disorder involving the loss of absorptive function of the intestinal tract resulting in diarrhea and malnutrition. Short bowel syndrome can be caused by necrotizing enterocolitis, gastroschisis, intestinal atresia or intestinal volvulus. Motility disorders, such as pseudo-obstruction, and rare epithelial disorders can also cause intestinal failure.

A focus on enteral autonomy

"UCLA is committed to optimizing the care of children with intestinal failure and has established novel treatment methods that are now used around the world," says Robert Venick, MD, associate clinical professor of pediatric gastroenterology, hepatology and nutrition at Mattel Children's Hospital UCLA.

The key is to create more time for patients to achieve intestinal adaptation. "The first principle of care when we meet a new patient with intestinal failure is to look at all medical, surgical and nutritional modalities available to reach enteral autonomy, and we do everything we can to help them achieve this," Dr. Venick explains. "We have had excellent outcomes in the field of intestinal transplantation, but reserve this life-saving therapy for those children without other feasible options."

While short bowel syndrome is transient in some cases, many children rely on long-term total parenteral nutrition (TPN) to prevent malnutrition. TPN provides intravenous nourishment by delivering a mixture of protein, fats, carbohydrates, vitamins and minerals through a catheter into a central vein. While TPN is life-saving for infants and older children facing intestinal failure, it can be associated with potentially life-threatening complications including central line-associated blood stream infections (CLABSI), loss of central venous access sites and intestinal failure-associated liver disease (IFALD).

Avoiding transplantation

In recent years, healthcare providers have made significant strides in the understanding, prevention and treatment of intestinal failure-associated liver disease, which is usually the primary complication that leads to transplantation. UCLA's multidisciplinary Pediatric Intestinal Rehabilitation and Transplantation teams have designed management protocols that focus on maximizing enteral nutrition, minimizing CLABSIs, and providing lipids at a physiologically appropriate dose in order to reduce the risk of liver damage. Moreover, researchers at UCLA have conducted some of the early trials that are paving the way for the use of IV omega-3 lipid formulations, which appear to have a protective effect on the liver.

The preservation of liver health allows the treatment team to focus on the medical management of the child's condition with the emphasis on shifting nutrition from intravenous to enteral — a process known as intestinal adaptation. These strategies have shown dramatic results. Mortality rates for infants awaiting combined liver and intestinal transplant have fallen from 50 percent to less than 20 percent in recent years. Additionally, advances in intestinal adaptation have led to fewer children requiring transplantation. The progress in intestinal rehabilitation is credited to a multidisciplinary approach that includes specialists in transplant surgery, gastroenterology, hepatology, neonatology, nursing, nutrition and social work.

Improved transplantation outcomes

Intestinal transplantation is indicated for patients with permanent intestinal failure who develop life-threatening complications while on TPN, such as intestinal failure-associated liver disease, recurrent sepsis and diminished central venous access.

Advances in surgical techniques and immunosuppression therapy have led to significant improvements in the short-term and long-term outcomes of children who undergo intestinal transplantation. One-year survival rates at UCLA are 85 percent compared to 70 percent worldwide while five-year survival rates are 70 percent compared to 50 percent worldwide. Post-transplant care includes a dedicated and detailed multidisciplinary approach with a high degree of individualized care for each of these unique patients.

Additionally, post-transplant care is a focus of research at UCLA with studies investigating immune-system monitoring, surveillance, nutrition, quality of life and long-term outcomes. Several faculty members participate in the leadership of the international Intestinal Transplant Association.

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