Cleveland Clinic has been performing pancreas transplants since 1985 and completed 16 such procedures in 2013 (for breakdown by type, see list at right). Its pancreas/kidney-pancreas transplant program has among the largest volumes, best outcomes and shortest wait times of all such programs in its region.

The program’s patient survival rates compare well with national norms (see graphs on p. 21). Notable outcomes from the January 2014 report of the Scientific Registry of Transplant Recipients (SRTR) include:

- 100 percent one-year patient survival for both pancreas and kidney-pancreas transplants
- 11.3-month median time to transplant for kidney-pancreas transplants, shorter than the national median (14.0 months) and the medians for OPTN Region 10 (12.0 months) and the local Donation Service Area (12.9 months)
- 25.5-month median time to transplant for pancreas-only procedures (vs. national median of 27.2 months)

Although the SRTR does not model pancreas graft survival, Cleveland Clinic outcomes are strong on this metric as well. For instance, one-year graft survival among pancreas and kidney-pancreas transplants was 97 percent by Kaplan-Meier survival analysis for the period tracked in the January 2014 SRTR report.

Culture of collaboration

Cleveland Clinic’s pancreas/kidney-pancreas transplant program is a key part of a comprehensive suite of medical and surgical services to manage type 1 diabetes and related conditions. The program team includes transplant surgeons, transplant endocrinologists, transplant nephrologists and a host of supporting clinical personnel.

There is considerable staffing overlap with the kidney transplant team (see preceding section), which promotes close clinical and research collaboration. For the many pancreas transplant candidates with end-stage renal disease, the program is well equipped to offer simultaneous pancreas-kidney (SPK) transplantation or...
sequential pancreas-after-kidney (PAK) transplantation, depending on the patient’s circumstances and needs.

The pancreas transplant team also collaborates regularly with the liver and intestinal/multivisceral transplant teams for en bloc pancreas transplantation, which offers increased immunologic protection from the other transplanted organs and can also reduce the risk of graft thrombosis.

**Expanding geographic reach**

A kidney-pancreas transplant program in Indianapolis was officially started in 2012 by St. Vincent Transplant Services, a partnership for kidney transplantation between Cleveland Clinic and St. Vincent Indianapolis Hospital since 2008 (see p. 15). The program, which is directed by Cleveland Clinic staff, successfully performed its first simultaneous kidney-pancreas transplant in February 2013.

**Beta cell therapy for diabetes**

For patients with type 1 diabetes, innovations in beta cell therapy promise a more comprehensive approach to diabetes management. Cleveland Clinic is helping shape discussion around beta cell therapy for diabetes, such as by convening the 1st Cleveland Clinic Beta Cell Therapy Symposium in November 2014. This singular meeting features a national faculty of experts addressing topics such as bioengineering of beta cells, the bionic pancreas, islet encapsulation, islet allograft rejection in the setting of autoimmune diabetes, and current global activities. Challenges and future directions are also being explored.

A centerpiece of emerging beta cell therapy for diabetes is transplantation of donor islet cells (allogeneic islet cell transplantation), which is being studied as a minimally invasive alternative to whole-organ pancreas transplant. Significant progress has been made in islet allotransplantation, but the procedure remains experimental due to imperfections in the isolation and purification of islet cells from deceased donors as well as inadequate means for preventing rejection of donor islets.

While techniques are being refined to improve islet harvest from deceased donor organs, major translational research activities are underway to establish alternate islet sources, such as islet-producing stem cells from humans and islet cells from nonhuman species (xenotransplantation). Other efforts focus on identifying less-toxic immunosuppressive regimens and inducing immune tolerance to donor islets. New microencapsulation technologies also show promise for providing immunosolation for transplanted islets while still permitting insulin release.

Cleveland Clinic is actively consulting with companies and academic centers at the forefront of beta cell therapy to ensure that it will be among the earliest adopters of these technologies. It is committed to bringing these minimally invasive — and potentially immunosuppressant-free — options to a broad range of patients with diabetes.

For nondiabetic patients, Cleveland Clinic has pioneered the use of pancreatic islet cell autotransplantation following total pancreatectomy secondary to severe chronic pancreatitis (see sidebar). Cleveland Clinic has performed 50 islet autotransplants from 2007 through 2013 and actively offers the therapy for appropriate patients.

**2013 QUICK TAKE**

11.3-month median time to kidney-pancreas transplant, shorter than the national, regional and local medians
FUTURE OF TRANSPLANTATION:
PIONEERING ISLET AUTOTRANSPLANTATION AFTER PANCREATECTOMY FOR CHRONIC PANCREATITIS

For patients with crippling pain from chronic pancreatitis refractory to medical/endoscopic interventions or traditional surgery, total pancreatectomy is the last resort.

Total pancreatectomy has been considered an extreme option because it leads to brittle diabetes, but insulin-dependent diabetes can now be prevented or mitigated by transplanting the patient’s own isolated pancreatic islet cells back to the patient. Islets are injected into the portal vein, which transports them to the liver, their site of implantation (see image). The more islets that can be isolated and infused, the greater the chance of avoiding or controlling the effects of surgical diabetes.

Under the direction of R. Matthew Walsh, MD, Chairman of General Surgery, Cleveland Clinic has been in the vanguard of total pancreatectomy with autologous islet transplantation. Since Dr. Walsh performed the first islet autotransplant at Cleveland Clinic in 2007, 50 such transplants have been performed here through 2013, representing one of the world’s largest experience bases. Significant pain and quality-of-life improvements have been documented (Walsh et al, J Gastrointest Surg. 2012;16:1469-1477).

The procedure holds particular appeal for young patients with refractory chronic pancreatitis, who otherwise face a lifetime of caring for diabetes and its complications. Cleveland Clinic has performed islet autotransplants in numerous adolescents, demonstrating an ability to obtain a sufficient number of islets to allow even very young patients to achieve insulin independence. Earlier effective pain treatment in patients with chronic pancreatitis can also lead to better overall outcomes and rapid transition to productive lives without narcotics.

Cleveland Clinic surgeons remain focused on innovating new techniques to efficiently isolate higher numbers of islets following pancreatectomy and to improve the implantation and function of infused islets.

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Islet cells after implantation in the liver.