Pancreas Transplantation

Policy Number: 2016M0053B  Effective Date: November 1, 2016

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INSTRUCTIONS:

“Medical Policy assists in administering UCare benefits when making coverage determinations for members under our health benefit plans. When deciding coverage, all reviewers must first identify enrollee eligibility, federal and state legislation or regulatory guidance regarding benefit mandates, and the member specific Evidence of Coverage (EOC) document must be referenced prior to using the medical policies. In the event of a conflict, the enrollee’s specific benefit document and federal and state legislation and regulatory guidance supersede this Medical Policy. In the absence of benefit mandates or regulatory guidance that govern the service, procedure or treatment, or when the member’s EOC document is silent or not specific, medical policies help to clarify which healthcare services may or may not be covered. This Medical Policy is provided for informational purposes and does not constitute medical advice. In addition to medical policies, UCare also uses tools developed by third parties, such as the InterQual Guidelines®, to assist us in administering health benefits. The InterQual Guidelines are intended to be used in connection with the independent professional medical judgment of a qualified health care provider and do not constitute the practice of medicine or medical advice. Other Policies and Coverage Determination Guidelines may also apply. UCare reserves the right, in its sole discretion, to modify its Policies and Guidelines as necessary and to provide benefits otherwise excluded by medical policies when necessitated by operational considerations.”
POLICY DESCRIPTION:

This policy describes the use of pancreas transplantation, simultaneous pancreas-kidney transplantation, and pancreas-after-kidney transplantation performed in patients with diabetes mellitus to improve their quality of life, primarily by eliminating acute complications. The goal is to eliminate the need for exogenous insulin, the associated problems of imperfect glucose control, and renal dialysis. The procedure is also intended to prevent, slow, or reverse, secondary diabetic complications, including retinopathy, neuropathy, nephropathy, and vasculopathy.

There are three variations of pancreas and kidney/pancreas transplants.

a. Both organs can be transplanted during one procedure and this is referred to as Simultaneous Pancreas Kidney transplantation (SPK)
b. The pancreas can be transplanted after a kidney transplant and this is referred to as Pancreas After Kidney transplantation (PAK)
c. The pancreas can be transplanted alone and this is called Pancreas Transplant Alone (PTA)

Pancreas transplantation alone (PTA) and pancreas-after-kidney transplant (PAK) are standard treatment options in the management of patients with uncontrolled or severely disabling Type I diabetes mellitus (DM) with adequate renal function. Simultaneous pancreas-kidney transplant (SPK) is considered a treatment option for individuals with Type I DM who have already developed end-stage renal disease (ESRD) or for whom ESRD is inevitable.

The challenge for the transplant team is to choose their candidates wisely to optimize the scarce supply of donor organs and to transplant early enough in the patient’s illness to assure a good chance for recovery. The availability of a living kidney donor is usually the determining factor in the choice of PAK over SPK, because the latter is generally completed with deceased donor organs.

COVERAGE RATIONALE / CLINICAL CONSIDERATIONS:

MEDICALLY NECESSARY:

- PANCREAS TRANSPLANTATION ALONE
  
  Pancreas transplantation alone (PTA) either deceased or living-donor segmental is considered MEDICALLY NECESSARY for an individual with insulin dependent diabetes mellitus (IDDM), which despite optimal medical management and adherence to treatment recommendations, is poorly controlled as manifested by the following:
  
  - Labile diabetes mellitus with documented history of frequent, acute and severe metabolic complications (e.g., hypoglycemia, hyperglycemia, ketoacidosis) of such severity that requires medical attention
  - Failure of insulin-based management to prevent acute complications
  - Severe physical or psychological impairment that make it impossible to administer exogenous insulin safely

- SIMULTANEOUS PANCREAS-KIDNEY TRANSPLANTATION
  
  Simultaneous pancreas-kidney transplant (SPK) or simultaneous cadaver-donor pancreas and living-
donor kidney (SPLK) transplantation is considered **MEDICALLY NECESSARY** for individuals with:

- Insulin dependent diabetes mellitus (IDDM), which despite optimal medical management and adherence to treatment recommendations is poorly controlled, AND
- End-stage renal disease that requires dialysis or is expected to require dialysis in the next 12 months and meets the transplant institution's selection criteria.

**• PANCREAS-AFTER-KIDNEY TRANSPLANTATION**

Pancreas-after-kidney transplantation (PAK) is considered **MEDICALLY NECESSARY** for an individual with Type I diabetes mellitus, which despite optimal medical management and adherence to treatment recommendations is poorly controlled.

**• RETRANSLANTATION:**

Usually due to non-function of the grafted organ(s), chronic rejection and chronic allograft pancreatitis. One pancreas alone, one pancreas after kidney or one simultaneous pancreas/kidney (SPK or SPLK) re-transplantation after failure of the primary graft is considered **MEDICALLY NECESSARY** provided the individual meets the transplant criteria above.

A third or subsequent pancreas alone, pancreas after kidney or simultaneous pancreas/kidney (SPK or SPLK) transplantation is considered **INVESTIGATIONAL AND/OR EXPERIMENTAL AND NOT MEDICALLY NECESSARY.**

**• AUTOLOGOUS ISLET CELL TRANSPLANTATION:**

Total Pancreatectomy with Autologous Islet Cell Transplantation (sometimes referred to as Islet Autologous Transplantation or IAT) may be considered **MEDICALLY NECESSARY** for severe, non-malignant, chronic pancreatitis requiring partial or total pancreatectomy to prevent the immediate onset of insulin dependent diabetes mellitus.

*Note: Autologous islet cell transplantation does not require treatment with immunosuppressive drugs. Post-infusion management of these patients is the same as the management of any other patient at risk for the development of diabetes. Autologous islet cell transplantation is a laboratory and procedural add-on to the cost of a total pancreatectomy. It should not be considered an organ transplant.***

**INVESTIGATIONAL AND NOT MEDICALLY NECESSARY:**

**• ALLOGENEIC ISLET CELL TRANSPLANTATION.**

*Note: CMS considerers Allogeneic Islet Cell transplantation an experimental procedure and IS NOT covered except:*

- When performed under a clinical trial AND
- A clinical trial benefit exists AND
- The trial conforms to the provisions of that benefit

**• LIVING DONOR PANCREAS TRANSPLANTATION** (e.g., partial pancreas transplantation, segmental pancreas transplantation).

**• XENOTRANSPLANTATION OF SOLID ORGAN** (e.g., porcine xenografts)

**• BIOARTIFICIAL PANCREAS DEVICE**
Clinical Considerations:
SPK, PAK or PTA may be indicated in patients with either Type 1 or Type 2 diabetes. Pancreas transplantation can provide excellent outcomes for patients with labile diabetes (Gruessner). The outcomes of combined kidney pancreas transplants in Type 2 diabetics are comparable to the outcomes in Type 1 diabetics.

SPK transplant is the definitive treatment of Type 1 diabetes combined with end-stage renal disease. Long-term graft function can lead to improvement in diabetes-related complications and, in patients younger than 50 years, can lead to improved overall survival. PAK transplant and PA transplant do not result in similar improvements in patient survival, but with appropriate patient selection, they can improve quality of life by rendering patients insulin-free. (Dhanireddy)

Appropriate candidates will have ALL of the following characteristics: (Stratta)
• Insulin requiring diabetes for > 5 years receiving ≤ 1 unit/kg/day, and
• BMI <= 30, and
• Age < 60, and
• No history of major vascular events such as bilateral limb amputations and disabling CVA, AND
• Not actively smoking, and
• Left ventricular ejection fraction ≥ 40% with no left ventricular hypertrophy.

Note: Serum C-peptide - Serum C-peptide measurements are not required. Transplant candidacy is based on other considerations.

For multi-organ transplant requests, criteria must be met for each organ requested. In those situations, an individual may present with a concurrent medical condition which would be considered an exclusion or a comorbidity that would preclude a successful outcome, but would be treated with the other organ transplant. Such cases will be reviewed on an individual basis for coverage determination to assess the member's candidacy for transplantation.

Contraindications (this list may not be all-inclusive):
• Metastatic cancer or malignancy that is expected to significantly limit future survival
• Persistent, recurrent or unsuccessfully treated major or systemic extra-renal infections
• Serious cardiac or other ongoing insufficiencies that create an inability to tolerate transplant surgery
• Serious conditions that are unlikely to be improved by transplantation as life expectancy can be finitely measured
• Systemic illness or comorbidities that would be expected to substantially, negatively impact the successful completion and/or outcome of transplant surgery
• A pattern of demonstrated patient noncompliance which would place a transplanted organ at serious risk of failure by not adhering to medical recommendations
• Potential complications from immunosuppressive medications are unacceptable to the patient
• Human immunodeficiency virus (HIV) disease unless all of the following are noted:
  - CD4 count greater than 200 cells/mm3
- HIV-1 ribonucleic acid (RNA) or viral load is undetectable
- Stable anti-retroviral therapy for more than three months
- Absence of serious complications associated with HIV disease (e.g., opportunistic infection, including aspergillum, tuberculosis, coccidioidomycosis, or resistant fungal infections; or Kaposi’s sarcoma or other neoplasm)
- Meeting all other criteria for pancreas or pancreas/kidney transplantation

**Complications:** Graft thrombosis, bleeding, abdominal abscess, pancreatic leak, urinary tract infection, and early rejection. (Ablorsu) Pancreas transplant is associated with more surgical complications and higher perioperative morbidity and mortality than kidney transplant alone. (Dhanireddy) There is a high incidence of kidney graft failure in SPK recipients, following a pancreas graft loss. About 50% of the kidney graft failure occurred within three months after the loss of the pancreas graft. (Hill)

**BACKGROUND:**

Diabetes is characterized by high blood glucose levels that result from defects in the body's ability to produce and/or use insulin and is generally split into two types: Type 1 and 2 diabetes. Type 1 diabetes, previously referred to as juvenile diabetes because it is most often diagnosed in children and young adults, arises because the body does not produce insulin. In contrast, in Type 2 diabetes, the body either does not produce enough insulin or the cells ignore the insulin (insulin resistance). The prevalence of diabetes in the United States is estimated at 25.8 million children and adults, or 8.3% of the population; of these, only 5% have Type 1 diabetes.

**Symptoms and Complications:** The deficiency of insulin among diabetic patients leads to increased blood sugar levels (hyperglycemia), resulting in dehydration and potentially ketoacidosis, a condition that, if left untreated, can cause stupor, coma, and death. The symptoms of diabetes can include excessive thirst and eating, as well as polyuria, itching, lassitude, and blurred vision. In addition, diabetes can lead to vascular disease involving the small and large blood vessels (microangiopathy and macroangiopathy), which in turn can result in late secondary complications, including retinopathy, neuropathy, cardiomyopathy, and/or nephropathy. In order to prevent these complications, normalization of carbohydrate and glucose metabolism is required. The standard treatment for diabetes consists of recommendations regarding diet and exercise, monitoring of blood glucose levels, and the administration of exogenous insulin. However, despite continued improvements in the control of blood sugar levels through the development of different types of insulin, new insulin delivery systems, and home blood glucose monitoring systems, a perfect strategy for blood glucose control by exogenous insulin delivery has not yet been developed. It is common for imprecise dose calculations or poor compliance to result in underdosing of insulin, which can lead to ketoacidosis, or overdosing, which can lead to hypoglycemia. Pancreas transplantation has been investigated as a means of providing an endogenous self-regulated source of insulin that could meet physiological insulin more accurately. Poorly controlled blood sugar levels may also lead to significant damage to the kidneys, which may result in complete or near-complete failure of the kidneys. During this state, referred to as end-stage renal disease (ESRD), renal dialysis or kidney transplantation is necessary to prevent death.

**Pancreas Transplantation:**

Improved surgical techniques and immunosuppressive protocols have led to improved patient and graft
survival. Patient survival now reaches over 95% at one year post-transplant and over 83% after 5 years. The best graft survival was found in SPK with 86% pancreas and 93% kidney graft function at one year. PAK pancreas graft function reached 80%, and PTA pancreas graft function reached 78% at one year. Also, the 1-year immunological graft loss rate also decreased:

- in SPK, the immunological 1-year graft loss rate was 1.8%,
- in PAK 3.7%, and
- in PTA 6.0%. (Gruessner)

Pancreas transplantation may be performed alone (pancreas transplantation alone [PTA]) in patients who show little (preuremic) or no (nonuremic) kidney insufficiency. Patients who have confirmed kidney dysfunction are candidates for both pancreas and kidney transplantation; pancreas transplantation may be performed simultaneously with a kidney transplant (simultaneous pancreas-kidney [SPK]), or following successful kidney transplantation (pancreas-after-kidney [PAK]). The availability of a living kidney donor is usually the determining factor in the choice of PAK over SPK because the latter is generally completed with deceased donor organs. Several unresolved issues remain. First, long-term immunosuppression therapy, which is required for patients who undergo organ transplants, has side effects, such as increased blood pressure and insulin resistance, that can mitigate against the benefits of normoglycemia. Second, there is continuing controversy as to whether SPK is superior to a separate procedure, kidney transplantation alone (KTA), especially when a living donor kidney (LDK) is available. A further drawback of SPK is a greater likelihood of technical failures due to the more complicated SPK procedure. Finally, the majority of patients that have undergone SPK to date had Type 1 diabetes, and the benefits and risks of the procedure have not been well characterized in patients with Type 2 diabetes.

**Preparation for Surgery:** Prior to being accepted as a transplant candidate, the patient undergoes a comprehensive assessment at a transplant center. In the United States, appropriate candidates are placed on the national transplant waiting list, which is maintained by the United Network for Organ Sharing (UNOS) through the federally established Organ Procurement and Transplantation Network (OPTN) (OPTN, 2012; UNOS, 2013). Of note is the cardiac evaluation included as part of the transplant work-up (Augustine, 2012). Until the last decade, clear coronary angiograms were considered mandatory before activation on the transplant waiting list; however, now nuclear myocardial perfusion scans give equivalent results and coronary angiograms are usually reserved for individuals with abnormal perfusion scans (Ruparelia et al., 2011).

**During Surgery:** During the SPK procedure, the patient is placed under general anesthetic. An incision is made in the lower abdomen, and the cadaveric pancreas is inserted into an intraperitoneal location and attached to the blood vessels, intestine, or bladder; the diseased pancreas is left in place. Since the pancreas performs both an exocrine and endocrine function, an outlet has to be created for each. The exocrine secretions are managed with either a duodenocystostomy, also referred to as bladder drainage (BD) or a duodenojejunostomy, also referred to as enteric drainage (ED). BD has the advantage of providing a means of monitoring pancreas graft function via urinary amylase measurements or cystoscopically directed biopsy. However, this constitutes a nonphysiologic connection between pancreas and genitourinary tract and, thus, can result in a number of urologic complications. The endocrine secretions, such as insulin, can be managed with either systemic drainage or portal venous drainage. Systemic drainage delivers secretions into the right iliac vein. It has been associated with hyperinsulinemia, which can lead to atherosclerosis. Portal drainage, which is considered the more physiologic option, empties endocrine secretions directly into the hepatic venous system. Portal venous drainage is possible only with the BD technique for exocrine drainage. The recent literature has reported a physiological benefit with portal-
enteric drainage (Stratta et al., 2000; Philosophe et al., 2001; Leeser and Bartlett, 2004; Zaman et al., 2004; Boggi et al., 2005; Gruessner and Sutherland, 2005; Monroy-Cuadros et al., 2006). The kidney graft typically comes from the same cadaver donor as the pancreas graft and, as in the pancreas replacement, the native kidney is left in place (Leeser and Bartlett, 2004; Zaman et al., 2004).

Post-surgery: Following surgery, the patient is closely monitored, usually in an intensive care unit. In the postoperative period, regimens to prevent vascular thrombosis of the allograft are begun. Duplex ultrasonography is routinely performed on the first postoperative day and as needed afterward to assess flow and function in the graft. A Foley catheter is left in place for 5 to 7 days, especially in BD cases. A nasogastric tube remains in place for 48 to 72 hours following transplantation, at which time oral feeding is initiated. The patient typically starts antiviral, antifungal, and antibacterial prophylaxis before surgery and this is continued after surgery. Maintenance immunosuppression begins very soon after surgery (Zaman et al., 2004; Nath et al., 2005b). Additional post-surgery risks and concerns include:

- Diabetic-specific concerns: Due to their disease characteristics, diabetic patients are at an increased risk during surgery. The effects of general anesthesia and surgery increase the secretion of cortisol, catecholamines, glucagon, and growth hormone; these events have an adverse outcome on blood glucose levels. In addition, while undergoing surgery, the patient is fasting and unconscious. Therefore, particular care must be taken to prevent hypoglycemia (Zaman et al., 2004).
- Immunosuppression: Prophylactic treatment against immunologic complications begins with induction therapy in the majority of pancreas transplant patients. This is followed by maintenance immunosuppression therapy, which may change over time (Meier-Kriesche et al., 2006).
- Kidney rejection: Kidney rejection is suspected on the basis of increase in serum creatinine levels and is confirmed with kidney biopsy. Kidney graft rejection is cause for suspicion of pancreas graft rejection. Urinary and serum amylase levels are also markers for pancreas graft rejection, or pancreas rejection may be diagnosed based on clinical signs (fever, graft tenderness) and/or biochemical tests (glucose intolerance). Confirmation of pancreas rejection requires percutaneous pancreas biopsy. The treatment for acute rejection is generally successful with a course of antilymphocyte therapy. Chronic pancreas rejection is diagnosed by the same method as acute rejection but has a typical histologic picture seen on percutaneous biopsy or graft pancreatectomy specimens. Clinically, there is a gradual loss of exocrine function followed by a loss of endocrine function in a graft that initially functioned. If a patient returns to exogenous insulin, the pancreas is considered to have failed. Kidney failure is defined as a return to dialysis or a return to pretransplant creatinine levels. Graft failure is also referred to as immunological loss (Humar et al., 2003; Leeser and Bartlett, 2004; Gruessner and Sutherland, 2005). Lastly, repeat SPKs are sometimes necessary and referred to as retransplantation (LaMattina et al., 2012).

Total Pancreatectomy with Autologous Islet Cell Transplantation (TP/AIT) for Chronic Pancreatitis

TP/AIT is intended for patients with chronic pancreatitis who have severe intractable pain that is unresponsive to medical, surgical, or endoscopic therapy. Such patients may have no demonstrable main pancreatic duct pathology, or they have minimal benefit or fail to respond to pancreatic resection or drainage procedures. Appropriate candidates for consideration for this therapy have end-stage chronic pancreatitis or other indications for surgery, such as debilitating abdominal pain and/or recurring acute pancreatitis causing a significant decrease in their quality of life (QOL).

The goal of AIT is to promote insulin therapy independence and reduce potential complications of diabetes in patients who have undergone TP for treatment of severe pain due to chronic pancreatitis. TP/AIT is
performed in a single procedure with the patient under general anesthesia. The pancreas is surgically removed (pancreatectomy). Islet cells from the patient’s resected pancreas are isolated in a laboratory with an enzyme solution, and prepared for transplantation. They are infused directly into the portal vein where some will remain viable in the liver. TP/AIT is intended for nondiabetic patients with chronic pancreatitis who have severe intractable pain that is unresponsive to medical, surgical, or endoscopic therapy. TP/AIT is performed by a trained and experienced surgical team with the patient under general anesthesia. The procedure requires the use of an operating room, a specialized tissue-processing laboratory, and an interventional radiology suite.

- There are only a handful of laboratories experienced in isolating the islets from the excised pancreas and relatively few centers in the US with extensive experience with autologous islet cell infusions and management of the patients post-infusion.
- Reinfusion of the islets does not prevent the pancreatic exocrine insufficiency that follows total pancreatectomy. This is managed in the same way as for any patient who has undergone a total pancreatectomy.
- Autologous islet cell transplant does not require treatment with immunosuppressive drugs. Post-infusion management of these patients is the same as the management of any other patient at risk for the development of diabetes.
- Autologous islet cell transplantation is a laboratory and procedural add-on to the cost of a total pancreatectomy. It should not be considered to be an organ transplant.
- Most patients will develop diabetes eventually (Dean). Even though the islets lodge in the liver and function normally initially, this is not a normal environment for them. The pancreas they were taken from was not normal. Because of the underlying pancreatic disease and normal loss in processing, the number and quality of islets is not normal. The reinfused islets will eventually stop functioning. But, for the time that they are functioning, the patient is protected against the immediate development of diabetes following a total pancreatectomy. However, concurrent IAT enabled a significant proportion of patients to remain independent of insulin supplementation. (Bramis)

REGULATORY STATUS:

1. **U.S. FOOD AND DRUG ADMINISTRATION (FDA):**
   The pancreas transplant procedure is not regulated by the FDA, per se. Rather, the U.S. Congress established the Organ Procurement and Transplantation Network (OPTN) when it enacted the National Organ Transplant Act (NOTA) of 1984. The Act called for a unified transplant network to be operated by a private, nonprofit organization under federal contract. The Department of Health and Human Services (HHS) solicited proposals in 1986 for the operation of the OPTN; the United Network for Organ Sharing (UNOS) was awarded the initial OPTN contract on September 30, 1986. It has continued to administer the OPTN for more than 16 years and four successive contract renewals. Effective March 16, 2000, HHS implemented a Final Rule establishing a regulatory framework for the structure and operations of the OPTN. Under the terms of the Final Rule, the policies intended to be binding upon OPTN members are developed through the OPTN committees and Board of Directors and then submitted to the Secretary of HHS for final approval (OPTN, 2003b).

2. **CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS):**
   A CMS National Coverage Determination (NCD 260.3) was identified for pancreas transplants.
Effective for services performed on or after July 1, 1999, whole organ pancreas transplantation is nationally covered by Medicare when performed simultaneous with or after a kidney transplant. If the pancreas transplant occurs after the kidney transplant, immunosuppressive therapy begins with the date of discharge from the inpatient stay for the pancreas transplant.

Effective for services performed on or after April 26, 2006, pancreas transplants alone (PA) are reasonable and necessary for Medicare beneficiaries in the following limited circumstances:

1. PA will be limited to those facilities that are Medicare-approved for kidney transplantation. (Approved centers can be found at http://www.cms.gov/ESRDGeneralInformation/02_Data.asp#TopOfPage
2. Patients must have a diagnosis of Type I diabetes:
   - Patient with diabetes must be beta cell autoantibody positive; or
   - Patient must demonstrate insulinopenia defined as a fasting C-peptide level that is less than or equal to 110% of the lower limit of normal of the laboratory's measurement method. Fasting C-peptide levels will only be considered valid with a concurrently obtained fasting glucose ≤ 225 mg/dL;
3. Patients must have a history of medically-uncontrollable labile (brittle) insulin-dependent diabetes mellitus with documented recurrent, severe, acutely life-threatening metabolic complications that require hospitalization. Aforementioned complications include frequent hypoglycemia unawareness or recurring severe ketoacidosis, or recurring severe hypoglycemic attacks;
4. Patients must have been optimally and intensively managed by an endocrinologist for at least 12 months with the most medically-recognized advanced insulin formulations and delivery systems;
5. Patients must have the emotional and mental capacity to understand the significant risks associated with surgery and to effectively manage the lifelong need for immunosuppression; and,
6. Patients must otherwise be a suitable candidate for transplantation.

Nationally Non-Covered Indications:

The following procedure is not considered reasonable and necessary within the meaning of section 1862(a)(1)(A) of the Social Security Act:

- Transplantation of partial pancreatic tissue or islet cells (except in the context of a clinical trial (see section 260.3.1 of the National Coverage Determinations Manual) is not considered reasonable and necessary within the meaning of section 1862(a)(1)(A) of the Social Security Act.

3. MINNESOTA DEPARTMENT OF HUMAN SERVICES (DHS):

MHCP coverage for organ and tissue transplant procedures is limited to those procedures covered by the Medicare program or approved by the DHS consulting contractor.

Transplant coverage includes: preoperative evaluation, recipient and donor surgery, follow-up care for the recipient and live donor, and retrieval of organs, tissues. All transplant related services are billed
CLINICAL EVIDENCE:

SUMMARY:
Pancreas Transplantation Alone (PTA)
There is some evidence that medically refractory Type 1 diabetics can achieve normoglycemia following successful pancreas transplant alone, and that this normalization of blood glucose may reduce the incidence or progression of certain secondary complications of diabetes. Very limited evidence suggests that these findings may also apply to insulin-requiring Type 2 diabetic patients. However, evidence of improved survival of diabetic patients compared with similar patients treated with conventional diabetes management is lacking, and questions remain regarding the long-term effects of certain immunosuppressive agents. Evidence regarding the efficacy of PTA in patients requiring retransplant is very sparse and insufficient to support conclusions regarding efficacy.

Simultaneous Pancreas-Kidney (SPK) Transplantation in Diabetic Patients
A large number of studies, including large-scale analyses of the transplant registries, have shown that simultaneous pancreas-kidney (SPK) transplantation is highly effective in extending patient survival and kidney graft survival rates and these effects persist for many years after SPK relative to kidney transplantation alone (KTA) among Type 1 diabetes patients with imminent or established end-stage renal disease (ESRD). The effect on patient survival was large, with 1 study finding 70% survival in the SPK group relative to 40% in the KTA group at 10 years follow-up. There was some evidence to support the use of SPK among Type 2 diabetic patients, but there were only a few studies in patients with Type 2 diabetes. Studies examining SPK relative to pancreas transplant only (PTA) and pancreas after kidney transplant (PAK) did not show the same differences among these key study outcomes; however, these studies comprised only a small subset of the studies reviewed. There is some evidence of improved secondary complications of diabetes and quality of life (QOL), but this evidence is sparse. Therefore, although there is considerable morbidity and an increased short-term risk of death associated with SPK transplantation and impact on patient survival has not been evaluated with randomized trials, the findings reviewed for the present report do support a benefit of SPK over time (≥ 10 years). Precise patient selection criteria have not been defined.

Total Pancreatectomy with Autologous Islet Cell Transplantation (TP/AIT)
A small number of centers of expertise have been treating patients with intractable pain due to chronic pancreatitis with TP/AIT and have reported their results periodically in case series. The main goals of surgery are pain control and decreased narcotics use; blood glucose control (avoidance of insulin or low daily dosages) is an additional goal of treatment. In the four main case series (n=26 to 179), insulin independence ranged from 0% to 40%, with rates somewhat dependent on length of follow-up and possibly on the etiologies of chronic pancreatitis (i.e., proportion due to alcohol use). Pain resolution or significant diminution was achieved for most patients, with 49% to 80% of patients able to discontinue use of narcotics. Predictors of insulin independence were high islet yield, lack of prior pancreatic surgery, and younger age at surgery.

Although the evidence is of low quality and very limited, TP/AIT might be an appropriate therapy for highly selected patients with a poor QOL due to severe, intractable pain from chronic pancreatitis that is unresponsive to conservative medical or standard surgical therapies when they are fully informed about
the risks and benefits of the procedure, and only when it is performed by a trained and experienced surgical team at a center of excellence or registered tissue establishment or as part of a well-designed and strictly monitored clinical trial.

APPLICABLE CODES:

The Current Procedural Terminology (CPT®) codes and HCPCS codes listed in this policy are for reference purposes only. Listing of a service or device code in this policy does not imply that the service described by this code is a covered or non-covered health service. The inclusion of a code does not imply any right to reimbursement or guarantee claims payment. Other medical policies and coverage determination guidelines may apply.

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<th>HCPCS Codes</th>
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<tr>
<td>G0341</td>
<td>Percutaneous islet cell transplant, includes portal vein catheterization and infusion</td>
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<tr>
<td>G0342</td>
<td>Laparoscopy for islet cell transplant, includes portal vein catheterization and infusion</td>
</tr>
<tr>
<td>G0343</td>
<td>Laparotomy for islet cell transplant, includes portal vein catheterization and infusion</td>
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<tr>
<td>S2065</td>
<td>Simultaneous pancreas kidney transplantation</td>
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**MODIFIER**

- Q0: Investigational clinical service provided in an approved clinical research study
- Q1: Routine clinical service provided in a clinical research study that is in an approved clinical research study

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<th>ICD-9 Procedures</th>
<th>Description</th>
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<td>S2.80</td>
<td>Pancreatic transplant, not otherwise specified</td>
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<td>S2.83</td>
<td>Heterotransplant of pancreas</td>
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<th>ICD-9 Diagnostic</th>
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<td>250.00-250.93</td>
<td>Diabetes mellitus</td>
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<td>Chronic kidney disease [CKD], renal failure, unspecified</td>
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<th>ICD-10 Codes</th>
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<td>E10.10-E10.9</td>
<td>Type 1 diabetes mellitus</td>
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<td>N18.1-N18.9</td>
<td>Chronic kidney disease (CKD)</td>
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<td>T86.890-T86.899</td>
<td>Complications of other transplanted tissue [when specified as pancreas transplant]</td>
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<tr>
<td>Z79.4</td>
<td>Long term (current) use of insulin</td>
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<th>ICD-10 Procedures</th>
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<td>OFYG0Z0</td>
<td>Transplantation of pancreas, allogeneic, open approach</td>
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<td>OFYG0Z1</td>
<td>Transplantation of pancreas, syngeneic, open approach</td>
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<td>3E030U1</td>
<td>Introduction of Nonautologous Pancreatic Islet Cells into Peripheral Vein, Open Approach</td>
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<tr>
<td>3E033U1</td>
<td>Introduction of Nonautologous Pancreatic Islet Cells into Peripheral Vein, Percutaneous Approach</td>
</tr>
<tr>
<td>3E03JU1</td>
<td>Introduction of Nonautologous Pancreatic Islet Cells into Biliary and Pancreatic Tract, Percutaneous Approach</td>
</tr>
<tr>
<td>3E07JU1</td>
<td>Introduction of Nonautologous Pancreatic Islet Cells into Biliary and Pancreatic Tract, Via Natural or Artificial Opening</td>
</tr>
<tr>
<td>3E08JU1</td>
<td>Introduction of Nonautologous Pancreatic Islet Cells into Biliary and Pancreatic Tract, Via Natural or Artificial Opening Endoscopic</td>
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<table>
<thead>
<tr>
<th>CPT® Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>48160</td>
<td>Pancreatectomy, total or subtotal, with autologous transplantation of pancreas or pancreatic</td>
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</table>
islet cells (Not covered by Medicare)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>48550</td>
<td>Donor pancreatectomy (including cold preservation), with or without duodenal segment for transplantation</td>
</tr>
<tr>
<td>48551</td>
<td>Backbench standard preparation of cadaver donor pancreas allograft prior to transplantation, including dissection of allograft from surrounding soft tissues, splenectomy, duodenotomy, ligation of bile duct, ligation of mesenteric vessels, and Y-graft arterial anastomoses from iliac artery to superior mesenteric artery and to splenic artery</td>
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<tr>
<td>48552</td>
<td>Backbench reconstruction of cadaver donor pancreas allograft prior to transplantation, venous anastomosis, each</td>
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<tr>
<td>48554</td>
<td>Transplantation of pancreatic allograft</td>
</tr>
<tr>
<td>48556</td>
<td>Removal of transplanted pancreatic allograft</td>
</tr>
<tr>
<td>53300</td>
<td>Donor nephrectomy (including cold preservation); from cadaver donor, unilateral or bilateral</td>
</tr>
<tr>
<td>50320</td>
<td>Donor nephrectomy (including cold preservation); open, from living donor</td>
</tr>
<tr>
<td>50323</td>
<td>Backbench standard preparation of cadaver donor renal allograft prior to transplantation; including dissection and removal of perinephric fat diaphragmatic and retroperitoneal attachments, excision of adrenal gland, and preparation of ureter(s), renal vein(s), and renal artery(s), ligating branches, as necessary</td>
</tr>
<tr>
<td>50325</td>
<td>Backbench standard preparation of living donor renal allograft (open or laparoscopic) prior to transplantation, including dissection and removal of perinephric fat and preparation of ureter(s), renal vein(s), and renal artery(s), ligating branches, as necessary</td>
</tr>
<tr>
<td>50327</td>
<td>Backbench reconstruction of cadaver or living donor renal allograft prior to transplantation; venous anastomosis, each</td>
</tr>
<tr>
<td>50328</td>
<td>Backbench reconstruction of cadaver or living donor renal allograft prior to transplantation; arterial anastomosis, each</td>
</tr>
<tr>
<td>50329</td>
<td>Backbench reconstruction of cadaver or living donor renal allograft prior to transplantation; ureteral anastomosis, each</td>
</tr>
<tr>
<td>50340</td>
<td>Recipient nephrectomy (separate procedure)</td>
</tr>
<tr>
<td>50360</td>
<td>Renal allotransplantation, implantation of graft; without recipient nephrectomy</td>
</tr>
<tr>
<td>50365</td>
<td>Renal allotransplantation, implantation of graft; with recipient nephrectomy</td>
</tr>
<tr>
<td>50370</td>
<td>Removal of transplanted renal allograft</td>
</tr>
<tr>
<td>50547</td>
<td>Laparoscopy, surgical; donor nephrectomy (including cold preservation), from living donor</td>
</tr>
</tbody>
</table>

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REFERENCES:


86. Poommipanit N, Sampaio MS, Cho Y, et al. Pancreas after living donor kidney versus simultaneous pancreas-


105. Steurer W, Malaise J, Mark W, Koenigsrainer A, Margreiter R. Spectrum of surgical complications after


124. Wisgerhof HC, Van der Boog PJ, De Fijter JW, et al. Increased risk of squamous-cell carcinoma in simultaneous...


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<th>DATE</th>
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<tbody>
<tr>
<td>03/12/2014</td>
<td>New Policy. Reviewed by Medical Policy Committee.</td>
</tr>
<tr>
<td>03/27/2014</td>
<td>Reviewed and approved by the Quality Improvement Advisory and Credentialing Committee (QIACC).</td>
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<tr>
<td>04/01/2014</td>
<td>Published to UCare.org</td>
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