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# SIMULTANEOUS PANCREAS- KIDNEY TRANSPLANTATION: MANAGING NURSING PRACTICE CHALLENGES

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- ▣ Diabetes and its complications
- ▣ Treatment of diabetes by pancreas transplant
- ▣ Benefits and threats
- ▣ Specificity of simultaneous pancreas and kidney transplantation
- ▣ Complications of this therapy

# Diabetes

- ▣ > 380 million people worldwide suffer from diabetes (WHO)
- ▣ By 2035 the number of patients will exceed half a billion
- ▣ Poland > 2.5 million patients, 750 000 without awareness of their illness
- ▣ 200 000 suffer from type 1 diabetes
- ▣ 5 million people die each year from complications of diabetes

# CONSEQUENCES OF DIABETES

## DIABETES SUFFERERS WITH INSULIN-DEPENDENT DIABETES

- ◆ 5 x MORE CHANCE OF BLINDNESS
- ◆ 17 x MORE KIDNEY DISEASE (First cause of renal failure in developed countries)
- ◆ 5 x MORE NECROTIC CHANGES WITHIN THE LOWER LIMBS
- ◆ 2 x MORE CARDIOVASCULAR DISEASES
- ◆ VEGETATIVE NEUROPATHY
- ◆ LIFE EXPECTANCY 30% SHORTER IN RELATION TO THE GENERAL POPULATION

In addition, vegetative neuropathy, disrupts the sensation of hypoglycaemic states, what is the cause of death among these patients. Annually, 6% of diabetes-related deaths are related to severe hypoglycaemia, particularly dangerous during the night.

# Pancreas transplantation

- ▣ SPK – Simultaneous pancreas and kidney transplantation (80%)
- ▣ PAK – Pancreas transplantation in patients after prior successful kidney transplantation (12%)
- ▣ PTA – Pancreas transplantation alone (8%)

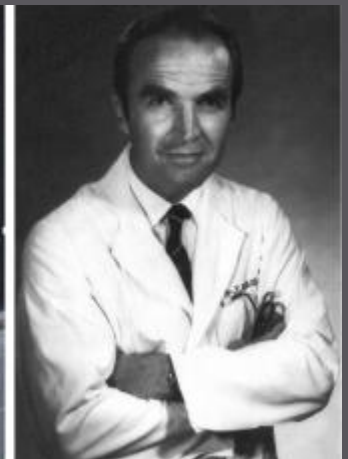
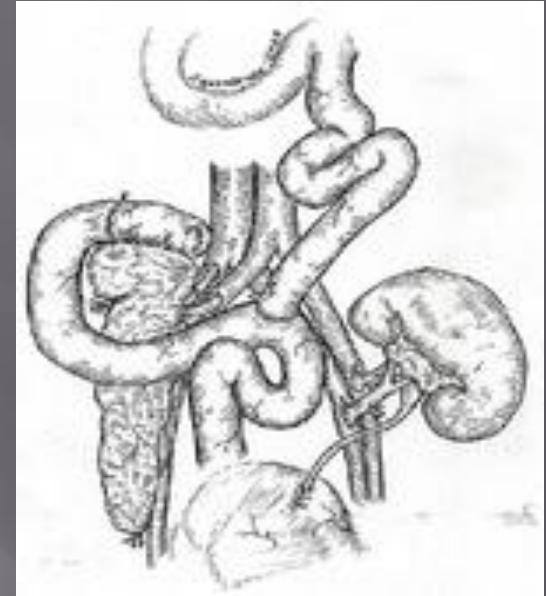
Pancreas transplant restores physiological glycemic control, effectively eliminating non-glucose episodes, by adequate secretion of glucagon and epinephrine.

# First successful Pancreas Transplantation

SPK

17 XII 1966

W.D.KELLY, R.C. LILLEHEI  
UNIVERSITY OF MINNESOTA



# Poland

- ▣ 1987 – unsuccessful pancreas transplantation in Szczecin, prof. S Zieliński
- ▣ February 1988 – First successful Pancreas Transplantation in Poland,

PROF. J. SZMIDT  
CSK Banacha Warszawa

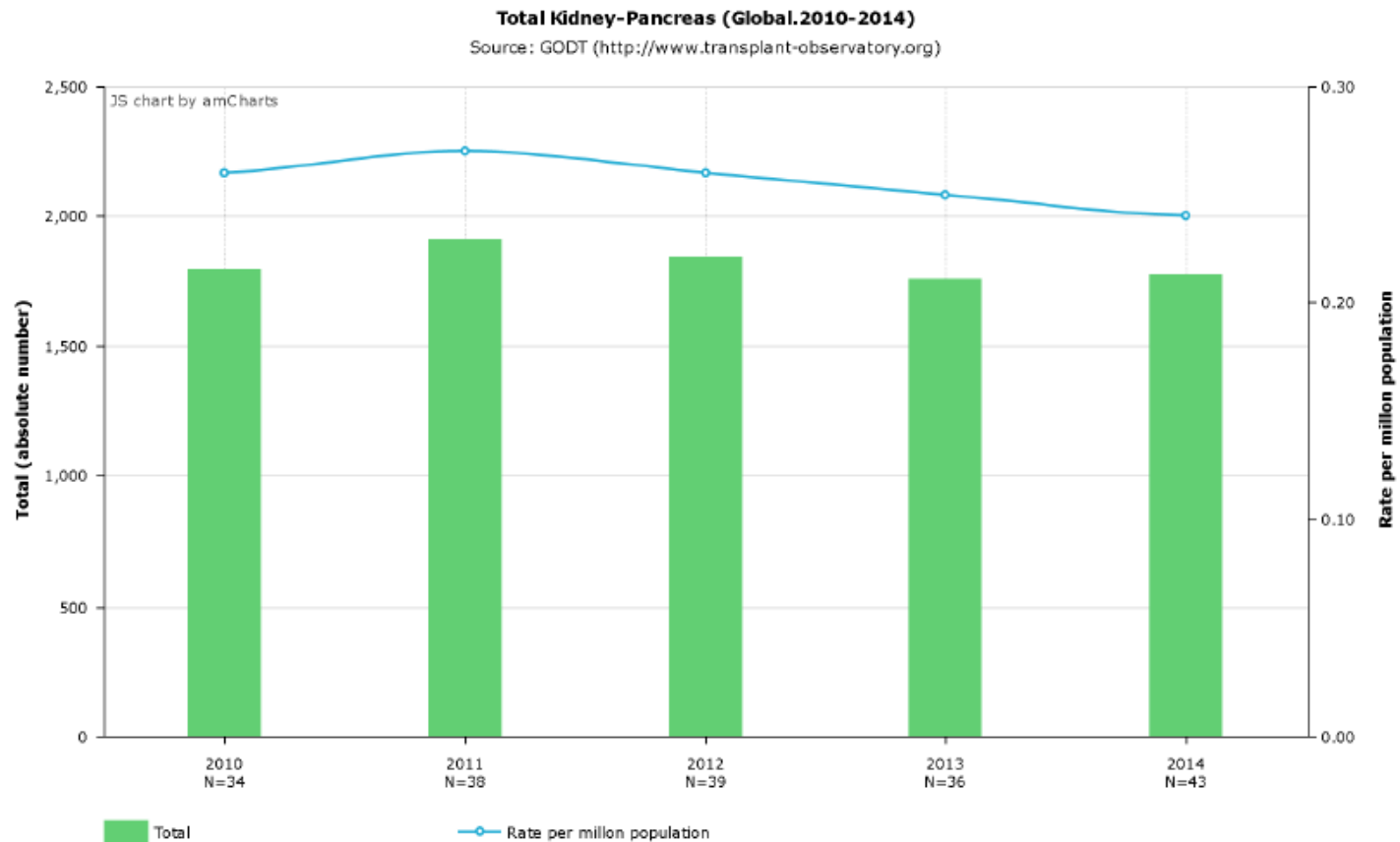


- ▣ April 1988

PROF. W. ROWIŃSKI, PROF. J.  
WAŁASZEWSKI, PSK No. 1 Warsaw



# SPK treatment



# SPK

The purpose of pancreas transplant surgery is to obtain non-insulin dependent and chronic normoglycemia in patients, which results in the inhibition and regression of secondary complications of diabetes.

## Benefits

- Retinopathy stabilization
- Metabolic adjustment
- Improvement of neuropathy
- Lower cardiovascular risk
- Prevents nephropathy
- Improving the quality of life

### CONCLUSIONS:

SPK transplantation can achieve a significant improvement of the quality of life of diabetic patients with end-stage renal disease.

### Evaluation of quality of life after simultaneous pancreas-kidney transplantation

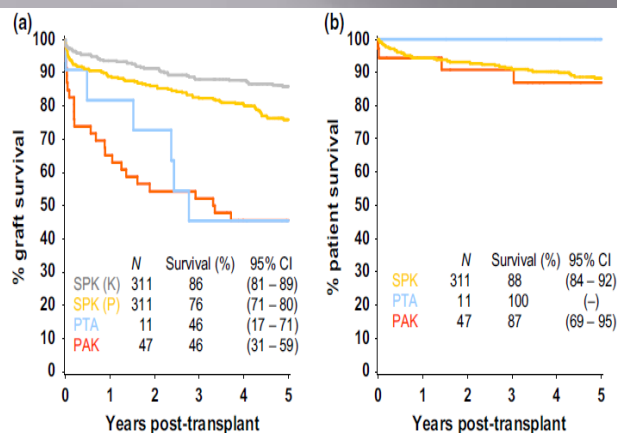
Tai Q, He XS, Wu LW, and all. 2010 Sep;30(9):2089-92. Chinese. PMID:20855258

## Threats

- Risk of surgery
- Immunosuppressive therapy and its complications

## Review Article

## Pancreas transplantation: a treatment option for people with diabetes

S. Mittal<sup>1,2,3</sup> and S. C. L. Gough<sup>2,3</sup><sup>1</sup>Nuffield Department of Surgical Sciences, <sup>2</sup>Oxford Centre of Diabetes, Endocrinology and Metabolism and <sup>3</sup>NIHR Oxford Biomedical Research Centre, Oxford, UK

**FIGURE 1** Five-year survival rates in the UK in recipients of pancreas transplantation using donors after brainstem death, stratified for transplant type: (a) Pancreas graft survival and (b) Patient survival. Adapted from Mumford [86]. SPK(K), simultaneous pancreas and kidney transplant — kidney survival; SPK(P), simultaneous pancreas and kidney transplant — pancreas survival; PTA, pancreas transplant alone; PAK, pancreas-after-kidney transplant.

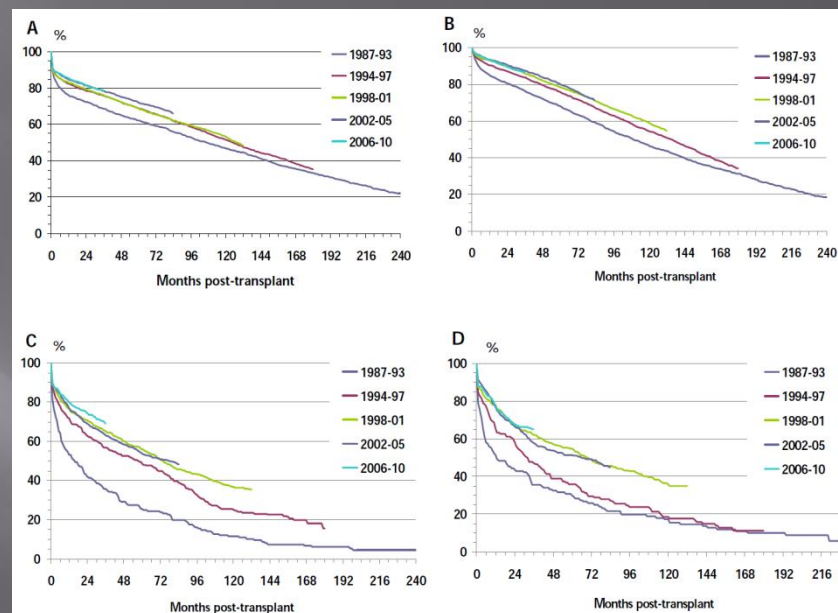
The results indicate that survival of the transplanted pancreas is longer if it is transplanted along with the kidney compared to other options.

## 2011 Update on Pancreas Transplantation: Comprehensive Trend Analysis of 25,000 Cases Followed Up Over the Course of Twenty-Four Years at the International Pancreas Transplant Registry (IPTR)

Angelika C. Gruessner

Division of Epidemiology and Biostatistics, Mel and Enid Zuckerman College of Public Health, University of Arizona, 1295 N. Martin, Tucson AZ 85724, USA. E-mail: agruessner@mail.arizona.edu

Manuscript submitted April 11, 2011; resubmitted April 19, 2011; accepted May 11, 2011



**Figure 12.** Primary deceased donor graft function over 5 eras for simultaneous pancreas kidney (SPK) pancreas graft (A), SPK kidney graft (B), pancreas after kidney (PAK) pancreas graft (C), and pancreas transplant alone (PTA) pancreas graft (D).

It is also important to emphasize the improvement of the survival of organs in particular years of performing these procedures. This may be due to currently used better operating techniques and immunosuppressive drugs.

# Long-term outcomes after simultaneous pancreas–kidney transplant

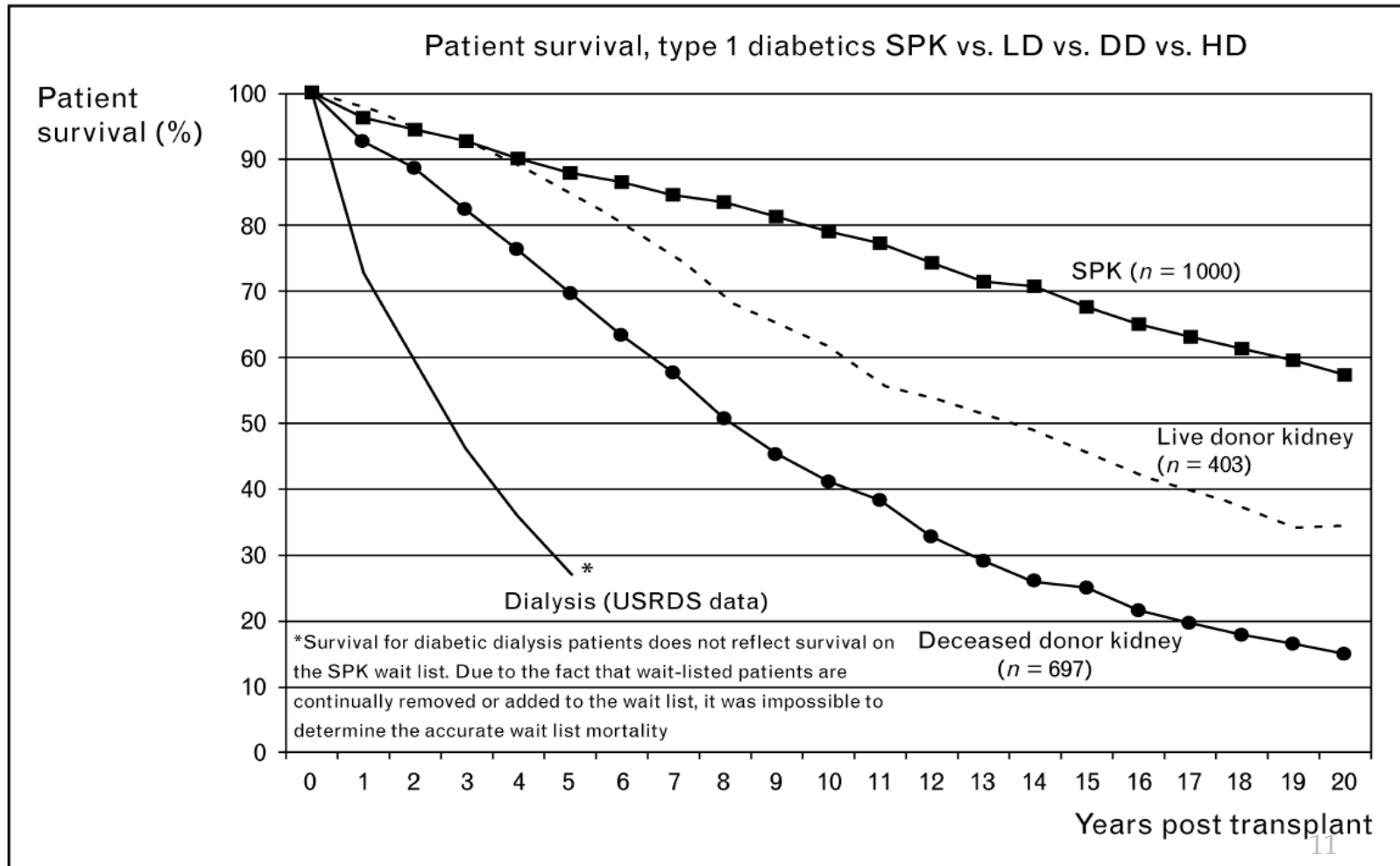
Philip Y. Wai and Hans W. Sollinger

University of Wisconsin, Madison, Wisconsin, USA

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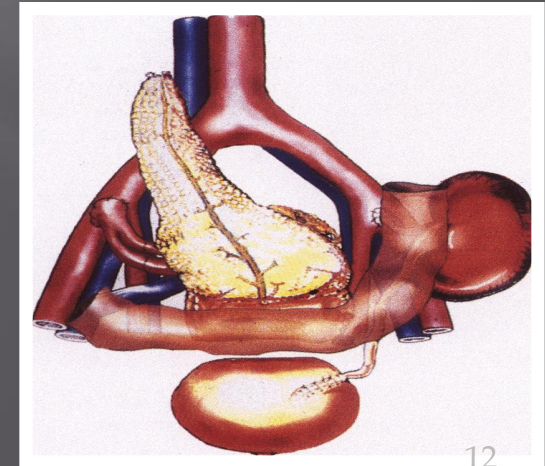
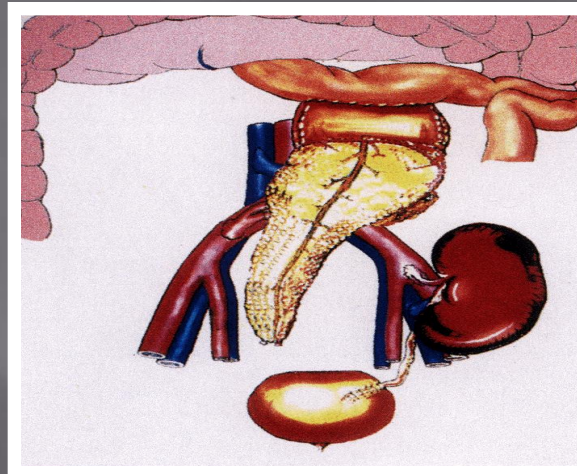
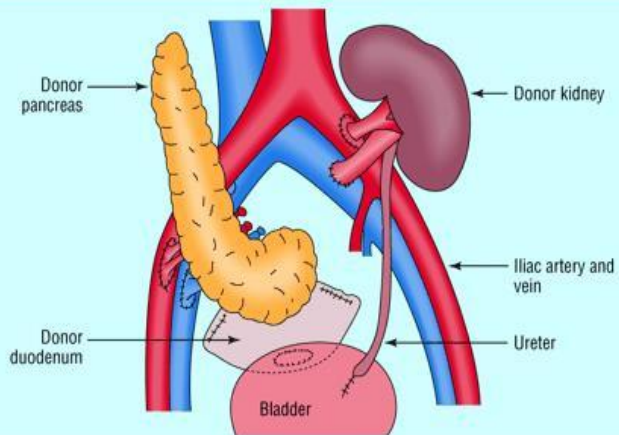
Current Opinion in Organ Transplantation 2011, 16:128–134

Figure 2 Patient survival in type 1 diabetic patients



# Operational Techniques

- The **pancreas** is transplanted **heterotopically** along with a donor duodenum fragment that is fused to the small intestine, with the recipient's duodenum or with the recipient's bladder, which is definitely the least common. It must remember that the pancreas is an endocrine organ, but also extrinsic, and the pancreas juice produced by it must be drained, just by using the bowel or the bladder of the recipient.
- The **kidney** are **first** transplanted **intraperitoneally**, most often on the left hip plate, and then the **pancreas** is transplanted **into the midline** in a separate central line. There are two drains out of the operating area.



# Immunosuppression

- ▣ Antibodies
  - ✓ Monoclonal,
  - ✓ Polyclonal
- ▣ Tacrolimus
- ▣ MMF
- ▣ Steroids

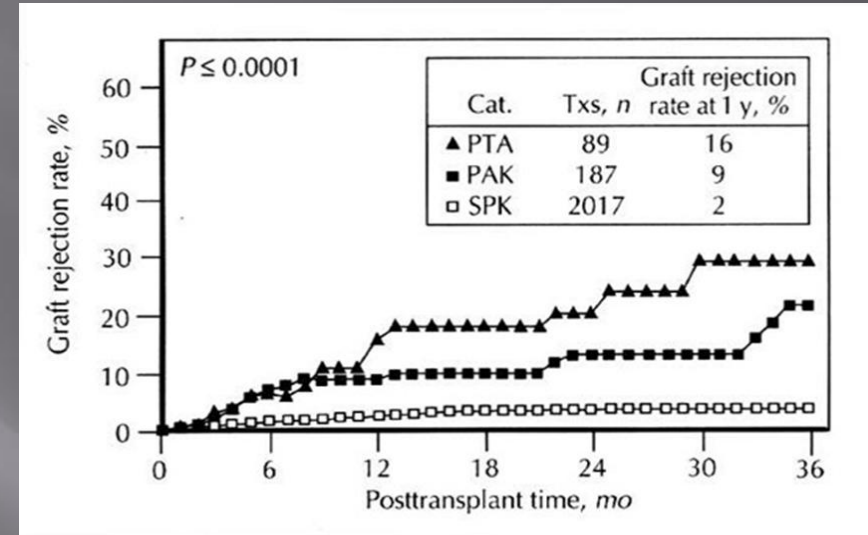


# Postoperative surgical complications 30-40%

- ▣ **graft thrombosis** (10% of recipients) - sudden hyperglycemia, or a decrease in C-peptide, ↓ amylase- Immediate execution of Doppler ultrasonography or angio-CT, necessity of laparotomy (Trombectomy, graphectomy)
- ▣ **acute pancreatitis**, this complication is quite common but does not entail serious consequences; however, it requires early diagnosis and implementing a strict diet. It is the result of damage to the ischemia-reperfusion organ, which leads to micro organ dysfunction - ↑ amylase
- ▣ other possible complications include **peritonitis, pancreatic parenchymal necrosis, peripancreatic fluid collection or hemorrhage** (Drainage, relaparotomy)

# Rejection of organ(s)

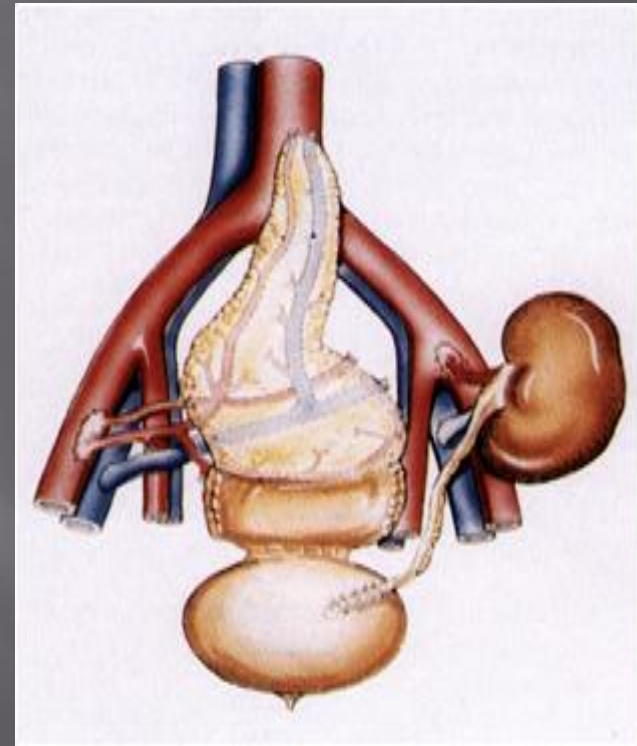
- The process of acute rejection of transplanted pancreas and kidneys, characteristic of the early post-transition period, can run independently
- Selective pancreas rejection is rare (5%) initially it is asymptomatic or sparsely manifested



- There are no pancreas-specific laboratory markers of pancreatic parenchyma damage. The fastest visible changes are the high amylase and lipase levels in the recipient's blood; however, biochemical abnormalities, including hyperglycaemia, are highly unrepresentable.
- Percutaneous or laparoscopic biopsy of transplanted pancreas is standard in early diagnosis, but it is at risk for complications (2.5 to up to 13%) and there is failure in up to 12% of patients.
- In clinical practice, the transplanted kidney function is monitored and discarded earlier. Creatinine levels are monitored and histopathological examination of the recovered kidney biopsy is performed.
- When diagnosing renal rejection, therapeutic treatment is unambiguous for both organs.

# Complications

- ▣ This group of recipients is more likely to have **infectious (fungal, bacterial, viral)** in the early postoperative period compared to recipients of the kidney itself and they are fatal.
- ▣ **Cardiovascular complications** are also characteristic, which can result in death of the recipient, with well-functioning transplants.
- ▣ At any time after transplantation, **chronic rejection** of the kidney or pancreas may occur.
- ▣ Only a small percentage of patients had a **recurrence of diabetes** resulting from the autoimmune process (not all 5%).



# Qualification and preoperative period



The process of preparing the patient for transplantation of the kidney, particularly in the preoperative period, should be given the same importance as the preparation of the patient for transplantation. Complications for diabetes, a patient's previous history of a physical disorder, particularly profound diagnostic in the field of cardiovascular assessment and coagulation disorders.

# Postoperative period

- Close monitoring of the patient's condition:
  - Vital signs (life parameters),
  - Biochemical parameters and blood morphology,
  - Transplanted pancreas and kidney activities,
  - Monitoring of immunosuppressive treatment,
- Participation in graft evaluation of the transplanted organs - preparation of the patient for imaging studies
- Therapeutic activities in accordance with the doctor's order
- Care activities based on recognized nursing problems



# Long-term care

The nurse is involved in diagnosing problems such as:

- ▣ worsening of transplanted pancreas activity (controlling the glucose and HbA1C)
- ▣ deterioration of transplanted kidney activity (monitoring creatinine concentration)
- ▣ undesirable effects of immunosuppressants (assessing the concentration of these drugs)
- ▣ secondary complications of diabetes, and most important cardiovascular
- ▣ recipients with diabetic foot syndrome before surgery are also at risk after transplant (therefore, it is necessary to re-educate these patients in the post-transplant period)



# Thank You for Your attention



*Warsaw*

• tobjasz.flog.pl