

## Introduction

- Living donor pancreas transplant is a potential treatment for type I diabetic patients with end-organ complications.
- The advantages of living pancreas-kidney transplant for the recipient include shorter and optimal timing, minimization of immunosuppression, and lower risk of rejection, infection, and posttransplant malignancies.
- While early surgical risks of donation have been reported, long-term medical outcomes in living pancreas donors are not known.

## Specific Aim

- To evaluate the post-donation risk of diabetes mellitus in living pancreas donors and to compare this risk with risk in a cohort of matched living kidney donors, as captured in linked national U.S. transplant registry and pharmacy claims databases.

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## Methods

- We used a database that integrated national registry identifiers for living pancreas donors (1987-2015) in the U.S. with records from a nationwide pharmacy claims warehouse (2005-2015).
- To compare outcomes in controls with baseline good health, we matched living pancreas donors to living kidney donors (1:3) by demographic traits and year of donation.
- The primary outcome was prescriptions for diabetic medications and supplies as a measure of post-donation diabetes mellitus.
- In secondary analyses, we computed proportions of days covered ( $[\text{days of treatment supplied over an observation window}] / [\text{days of observation}]$ ), a metric quantifying the fraction of days of identified insurance enrolment during which treatments were prescribed, among donors who received treatments.

Baseline characteristics	Living pancreas donors (n = 45)	Living kidney donors (n = 135)
Age at donation (years, SD)	39.0 (10.4)	39.2 (10.1)
Female	62.2%	62.2%
Race		
White	84.4%	85.9%
African American	8.9%	9.6%
Hispanic	4.4%	4.4%
Donor/recipient relationship		
First-degree relative	75.6%	75.6%
Other biological relative	4.4%	4.4%

## Results

- Among 73 pancreas donors in the study period, 45 were identified in the pharmacy database: 62% women, 84% white, and 80% relatives of the recipient (Table 1). Most donors (68.9%) underwent a simultaneous pancreas-kidney donation procedure.
- Over a mean post-donation follow-up period of 16 years, 26.7% of pancreas donors filled prescriptions for diabetes treatments, compared with 5.9% of kidney donors (odds ratio [OR] 4.13,  $P = 0.0003$ ) (Table 2).
- Among treated patients, the proportion of observed follow-up days covered by diabetic supplies was 70.4% for the pancreas donors and 41.9% for the kidney donors.
- Among the living pancreas donors, post-donation diabetes was not significantly associated with sex, race, ethnicity, blood type, or donor-recipient relationship, although power was limited by the sample size (Table 3).

Diabetes treatment	Living pancreas donors	Living kidney donors	Odds ratio (95% CI)	P value
Any	26.7%	5.9%	4.13 (1.91-8.93)	0.0003
Insulin or oral agent	20.0%	5.9%	4.50 (2.09-9.68)	0.0001
Insulin	11.1%	0	--	--
Oral agent	20.0%	5.9%	4.50 (2.09-9.68)	0.0001
Diabetes supplies	20.0%	4.4%	6.00 (2.53-14.24)	<0.0001

## Discussion

- Linkage of the national US donor registry with pharmacy claims data enabled characterization of long-term medical outcomes after living pancreas donation.
- Diabetes is four times more common after living pancreas donation than after living kidney donation, supporting clinical consequences from reduced endocrine reserve.
- There are limitations to our study. Baseline health information such as donor health insurance, physical examination measurements such as body mass index, and laboratory values such as hemoglobin A1c and oral glucose tolerance test results were not available in our databases.
- This information can be used to inform consideration of future practices and informed consent related to this procedure in the US and in other countries.

Baseline characteristics	Living pancreas donors with PDDM (n = 12)	Living pancreas donors without PDDM (n = 33)
Concomitant kidney donor	66.7%	69.7%
Age at donation (years, SD)	37.7 (8.2)	39.5 (11.1)
Female	50.0%	66.7%
Race		
White	83.3%	84.9%
African-American	8.3%	9.1%
Hispanic	0	6.1%
Donor/recipient relationship		
First-degree relative	75.0%	75.8%
Other biological relative	0	6.1%

Abbreviation: PDDM, post-donation diabetes mellitus