

## Living Donors with Pre-diabetes

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### ISSUE

What are the requirements and concerns for a potential kidney donor with pre-diabetes?

### DATA

Kidney disease caused by diabetes mellitus (DM), particularly type 2 DM, is now the most common cause of end stage kidney disease in the US.<sup>1</sup> Relatives of a patient with diabetes are at greater risk of developing the disease. The risk of diabetes is also higher for individuals who are overweight. Laboratory findings of pre-diabetes include elevated fasting glucose, elevated hemoglobin A1c and elevated glucose on an oral glucose tolerance test. Pre-diabetes may progress in severity over years to become classified as diabetes. Intervention at the pre-diabetes stage with diet and lifestyle changes can stall or even reverse this progression and prevent diabetes.

A potential kidney donor with elevated fasting glucose (defined as greater than 100 mg/dL by the American Diabetes Association and defined as greater than 110 mg/dL by the World Health Organization) may be advised to institute lifestyle changes to lose weight, increase exercise and thereby prevent the progression to diabetes mellitus. It is important to understand that the lifestyle changes that are effective to reverse pre-diabetes will need to be continued for the long term. Thus a program may decline a potential kidney donor with pre-diabetes who is young because of the continued risk for developing diabetes over many future years, particularly if they do not maintain the lifestyle changes. UNOS requires that potential kidney donors with diabetes mellitus be excluded from donation, thus the potential donor who is not able to correct their pre-diabetes may be denied as a donor candidate.<sup>2</sup> A small study of kidney donors with pre-diabetes who went on to donation noted higher rates of progression to diabetes (15.6%) compared to donors with normal glucose levels (2.2%) for those with pre-diabetes but no difference in remaining kidney function over the first 10 years following donation<sup>3</sup>.

A diabetes risk calculator is available to provide more accurate, personalized estimates of an individual's risk for diabetes using information on age, waist circumference, history of gestational diabetes, height, race/ethnicity, hypertension, family history, and exercise.<sup>4</sup>

## RECOMMENDATION

1. The risk of diabetes mellitus in donors with pre-diabetes is higher than for a healthy donor with normal glucose metabolism. Pre-diabetes increases the future risk for diabetes-associated kidney disease for the donor.
2. UNOS requires that potential donors with diabetes mellitus be excluded from donation. Potential donors with pre-diabetes need to make lifestyle changes including diet change, increased exercise and weight loss to normalize their glucose metabolism and reduce their risk for future diabetes. These changes will need to be continued over the long term.

## REFERENCES

1. USRDS accessed at [http://www.usrds.org/2015/view/v2\\_01.aspx](http://www.usrds.org/2015/view/v2_01.aspx)
2. UNOS donor evaluation policy accessed at [http://optn.transplant.hrsa.gov/ContentDocuments/OPTN\\_Policies.pdf#nameddest=Policy\\_14](http://optn.transplant.hrsa.gov/ContentDocuments/OPTN_Policies.pdf#nameddest=Policy_14)
3. Chandran, S., Masharani, U., Webber, A. B. & Wojciechowski, D. M. Prediabetic living kidney donors have preserved kidney function at 10 years after donation. *Transplantation* **97**, 748–754 (2014)
4. Heikes KE, Eddy DM, Arondekah B, Schlessinger L. Diabetes Risk Calculator: A simple tool for detecting undiagnosed diabetes and pre-diabetes. *Diabetes Care*, 2008; 31: 1040–1045.

Note: The recommendations in these chapters are the opinions of the Living Donor Community of Practice of AST. They are not meant to be prescriptive and opinions by other groups or institutions may be equally valid.