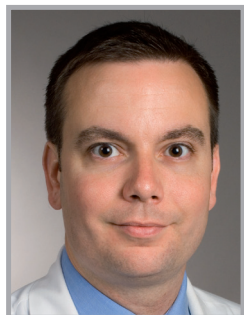


## ASK THE EXPERTS

# How can the National Kidney Foundation's Kidney Early Evaluation Program help to prevent/manage kidney disease in diabetic patients?



**Andrew S Bomback<sup>†</sup>:** Andrew S Bomback is Assistant Professor of Clinical Medicine at Columbia University College of Physicians and Surgeons (New York, NY, USA). He is a member of the steering committee of the National Kidney Foundation's Kidney Early Evaluation Program (KEEP). He has published over 45 peer-reviewed articles on chronic kidney disease, diabetes and hypertension. He is principal investigator or co-investigator of more than ten ongoing clinical trials examining new treatments for kidney diseases, with a special focus on novel therapies for glomerular diseases. He is the co-author, with George Bakris, of the text, *Chronic Kidney Disease and Hypertension Essentials*.



**Adam Whaley-Connell<sup>1,2</sup>:** Adam Whaley-Connell is an Assistant Professor of Medicine at the University of Missouri-Columbia School of Medicine and the Harry S Truman VA Medical Center in the Division of Nephrology and Hypertension (MO, USA). He is an investigator of the Diabetes and Cardiovascular Center (MO, USA) and is involved in a translational program focused on mechanisms of early kidney injury. He currently serves as Vice-Chair for the National Kidney Foundation Kidney Early Evaluation Program.

### Q What is the Kidney Early Evaluation Program program and how does it relate to diabetes?

#### ■ Whaley-Connell

The National Kidney Foundation's (NKF) Kidney Early Evaluation Program (KEEP) is a community-based screening program for the detection of kidney disease on a national/international level. The KEEP is based on volunteerism wherein providers donate their time to participate in screenings held in the community for those individuals at highest risk for kidney disease. While the name reflects a program, the NKF has created the KEEP to reflect a

system for detecting chronic kidney disease (CKD), providing education to the participants and their providers on risk factor control and kidney-disease related morbidity, and promoting awareness of CKD.

### Q Tell us more about taking part in KEEP: how are patients selected for participation in the program?

#### ■ Whaley-Connell

Screenings are held in several cities per month based on availability of time from volunteers. The program is free for anyone to participate in and targets high-risk



## News & Views

News

Journal Watch

Ask the Experts

“The program is free for anyone to participate in and targets high-risk individuals for kidney disease.”

<sup>1</sup>Division of Nephrology & Hypertension, Harry S Truman VA Medical Center, MO, USA

<sup>2</sup>University of Missouri-Columbia School of Medicine, MA436, DC043.0, One Hospital Dr., Columbia, MO 65212, USA

<sup>†</sup>Author for correspondence: Columbia University Medical Center, Division of Nephrology, 622 West 168th Street, PH 4-124, New York, NY 10032, USA; Tel.: +1 212 305 0320; Fax: +1 212 342 1814; asb68@columbia.edu

individuals for kidney disease, specifically those 18 years of age or older with diabetes, hypertension and/or a family history of kidney disease.

**Q What tests are performed at the screening center & how do they help to diagnose kidney disease?**

**■ Whaley-Connell**

The KEEP provides three simple tests that determine kidney function: measurement of albuminuria, serum testing for creatinine, and estimation of glomerular filtration rate (GFR). Participants receive a comprehensive health risk appraisal, blood pressure measurement, blood and urine testing for other CKD-related risk factors such as a lipid panel, glucose testing, and mineral metabolism markers, and the opportunity to discuss their health and review results with onsite clinicians.

**Q Is there any follow-up provided once patients have received their results?**

**■ Whaley-Connell**

Yes, the KEEP has two arms for follow-up. The NKF provides participants with education on their CKD-related risk and, if there is an identified provider, the NKF provides education to them as well. If there is no identified provider, we contact the participant and provide information regarding local providers and/or referral to the local health department if care is needed. The NKF then include participants with detectable CKD in a longitudinal program wherein participants are tracked over time.

**Q Are there any differences in the treatment & management of kidney disease in diabetic patients as compared with nondiabetic patients?**

**■ Bomback**

The goal of treating CKD, regardless of its etiology, is to halt or slow progression towards renal failure. In general, diabetic patients are at greater risk for progression and, in particular, for rapid progression than nondiabetic patients. Many nephrologists will be more aggressive in getting their diabetic patients to goals (e.g., goal blood pressure, goal weight, goal vitamin D

levels) than their non-diabetic patients. Still, nephrologists aim for good blood pressure control, healthy changes to lifestyle (e.g., more exercise and lower sodium intake) and avoidance of nephrotoxins for all CKD patients. The major difference for diabetics is the added importance of glycemic control, which alongside blood pressure control, remains the greatest area for intervention in CKD patients. In addition, most, if not all, diabetic CKD patients should be treated with a renin-angiotensin-aldosterone system blocking drug (the indication for renin-angiotensin-aldosterone system blockade is even more pressing when patients have abnormal urinary protein excretion) and cholesterol-lowering medications, alongside a daily baby aspirin. These drugs confer not only reno-protection, but important cardio-protection, as statistically diabetic CKD patients are more likely to die of premature cardiovascular disease than progress to end-stage renal disease requiring dialysis or transplantation.

Some nephrologists try to steer their CKD patients away from high protein intake; this practice has become less popular in recent years given concerns for malnutrition in patients, particularly diabetics, who do not consume enough protein. Still, many nephrologists (myself included) feel that protein intake is an important contributor to CKD progression if the majority of protein comes from animal sources rather than vegetable sources. Therefore CKD patients are often encouraged to limit their meat intake and opt for more vegetarian meals in their diets. Nondiabetic patients drift towards carbohydrates, typically pasta dishes, which can be a major problem for diabetics. In general, while all CKD patients could benefit from a nutritionist's input, the role of diet is especially important in diabetic CKD patients.

**Q Are there particular diabetic patient groups more at risk from kidney disease that should be targeted in the program?**

**■ Bomback**

A number of subgroups of diabetic patients are at a particularly high risk for progressive kidney disease, and fortunately KEEP screening programs specifically target

---

“The goal of treating CKD, regardless of its etiology, is to halt or slow progression towards renal failure.”

---

these populations. In a number of epidemiologic studies, including the KEEP, African-Americans have demonstrated a more severe and progressive form of CKD than white people [1–5]. Approximately one in three KEEP participants is African-American. Similarly, obesity confers added risk in CKD, and nearly one in three KEEP participants is overweight or obese. Finally, family history of kidney disease is another recognized risk factor for progressive forms of kidney disease, and approximately 20% of the KEEP participants self-report such a family history. While these risk factors of race, obesity and family history apply to all subtypes of CKD, they are particularly notable in diabetic CKD.

**Q What impact do you envisage this program having on the outcome of diabetic patients with kidney disease?**

**■ Bombback**

This is a crucial question to which the answer, currently, remains unknown. The KEEP (and other similar screening programs) was designed in the hope that early detection of kidney disease will lead to implementation of interventions – both medical and lifestyle – that can slow or halt progression of kidney disease. For example, identification of microalbuminuria with preserved GFR by KEEP screening could, theoretically, lead a caregiver to prescribe renin-angiotensin system blockade, a class of antihypertensive medications that has been shown in studies (particularly in diabetics) to improve overall renal and cardiovascular outcomes [6–8], especially when prescribed early in the disease course. However, this connecting of the dots is just that – no study to date has definitively shown that early detection improves outcomes. This is mostly due to lack of follow-up and small numbers; however, the KEEP should circumvent both of those issues, with far more than 100,000 participants screened and follow-up data now extending past 10 years on many of these participants.

**Q Why is it so important to raise awareness of diabetes-related CKD?**

**■ Bombback**

The major impetus to raise awareness is that CKD is a classically silent

disease. Most patients do not ‘feel’ the effects of impaired renal function until their estimated GFR falls below 10–15 ml/min/1.73 m<sup>2</sup> (diabetics sometimes experience symptoms at higher GFRs). Given that normal GFRs spans can range from 80 to 120 ml/min/1.73 m<sup>2</sup>, this translates to kidney disease often not being detectable clinically until the kidney is down to approximately 10% function or worse. Most kidney diseases reach a ‘point of no return’, which translates to a degree of renal dysfunction at which nephrologists shift their attention towards preparations for renal replacement therapy (dialysis or transplantation) and away from attempts at salvaging the native kidney. While this point of no return has not been precisely defined, in general it appears to fall at an estimated GFR between 30 and 45 ml/min/1.73 m<sup>2</sup>, when the overwhelming majority of patients will be symptom free. This tipping point likely occurs at higher GFRs (i.e., less impaired renal function) for diabetics versus nondiabetics, making it even more crucial to identify the disease in its earliest, and nonsymptomatic, state in diabetics. Raising awareness of CKD is the best way to ensure that diabetic patients see their primary care providers regularly and ask for their kidney function to be checked on this same regular basis. Screening for kidney disease does not need to be a one-way street; the diabetic patient can, and should, request that kidney function be checked in a routine fashion much the way other organs that can be affected by diabetes (the feet, the eyes and the peripheral circulation) are routinely screened.

**Financial & competing interests disclosure**

*Andrew S Bombback and Adam Whaley-Connell have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.*

*No writing assistance was utilized in the production of this manuscript.*

---

“The KEEP (and other similar screening programs) was designed in the hope that early detection of kidney disease will lead to implementation of interventions – both medical and lifestyle – that can slow or halt progression of kidney disease.”

---

## Bibliography

- 1 Young BA, Katon WJ, Von Korff M *et al.* Racial and ethnic differences in microalbuminuria prevalence in a diabetes population: the pathways study. *J. Am. Soc. Nephrol.* 16(1), 219–228 (2005).
- 2 Jolly SE, Burrows NR, Chen SC *et al.* Racial and ethnic differences in albuminuria in individuals with estimated GFR greater than 60 mL/min/1.73 m<sup>2</sup>: results from the Kidney Early Evaluation Program (KEEP). *Am. J. Kidney Dis.* 55(3 Suppl. 2), S15–S22 (2010).
- 3 Howard G, Prineas R, Moy C *et al.* Racial and geographic differences in awareness, treatment, and control of hypertension: the Reasons for Geographic and Racial Differences in Stroke study. *Stroke* 37(5), 1171–1178 (2006).
- 4 Appel LJ, Wright JT Jr, Greene T *et al.* Long-term effects of renin-angiotensin system-blocking therapy and a low blood pressure goal on progression of hypertensive chronic kidney disease in African Americans. *Arch. Intern. Med.* 168(8), 832–839 (2008).
- 5 Bomback AS, Kshirsagar AV, Whaley-Connell AT *et al.* Racial differences in kidney function among individuals with obesity and metabolic syndrome: results from the Kidney Early Evaluation Program (KEEP). *Am. J. Kidney Dis.* 55(3 Suppl. 2), S4–S14 (2010).
- 6 Lewis EJ, Hunsicker LG, Bain RP, Rohde RD. The effect of angiotensin-converting-enzyme inhibition on diabetic nephropathy. The Collaborative Study Group. *N. Engl. J. Med.* 329(20), 1456–1462 (1993).
- 7 Brenner BM, Cooper ME, de Zeeuw D *et al.* Effects of losartan on renal and cardiovascular outcomes in patients with Type 2 diabetes and nephropathy. *N. Engl. J. Med.* 345(12), 861–869 (2001).
- 8 Casas JP, Chua W, Loukogeorgakis S *et al.* Effect of inhibitors of the renin-angiotensin system and other antihypertensive drugs on renal outcomes: systematic review and meta-analysis. *Lancet* 366(9502), 2026–2033 (2005).

The editorial team is eager to receive any comments our readers might have on this topic for potential publication in future issues. Please direct any such communications to:

Laura McGuinness, Editor

[l.mcguinness@futuremedicine.com](mailto:l.mcguinness@futuremedicine.com)