

July 2020

### Screening for Microalbuminuria in Patients with Diabetes

#### Why?

- To identify patients with diabetic kidney disease (DKD).
- To distinguish DKD patients from diabetic patients with chronic kidney disease (CKD) from other causes. The latter require further investigation and possibly different clinical management.
- Because markers of kidney damage are required to detect early stages of CKD. Estimated glomerular filtration rate (eGFR) alone can only detect CKD stage 3 or worse.

#### When?

Begin screening:

- In type 1 diabetes – 5 years after diagnosis, then annually
- In type 2 diabetes – at diagnosis, then annually

#### Is it Microalbuminuria?

Measure urinary albumin-creatinine ratio (ACR) in a spot urine sample.

Category	Spot (mg/g creatinine)
Normoalbuminuria	<30
Microalbuminuria	30-300
Macroalbuminuria	>300

#### How?

\* Exercise within 24 hours, infection, fever, congestive heart failure, marked hyperglycemia, pregnancy, marked hypertension, urinary tract infection, and hematuria.

### Screening for Microalbuminuria in Patients with Diabetes

#### Is it DKD?

CKD should be attributable to diabetes if:

- Macroalbuminuria is present; or
- Microalbuminuria is present:
  - in the presence of diabetic retinopathy
  - in type 1 diabetes of at least 10 years' duration

GFR (mL/min)	CKD Stage*	Albuminuria		
		Normoalbuminuria	Microalbuminuria	Macroalbuminuria
>60	1 + 2	At risk <sup>a</sup>	Possible DKD	DKD
30-60	3	Unlikely DKD <sup>a</sup>	Possible DKD	DKD
<30	4 + 5	Unlikely DKD <sup>a</sup>	Unlikely DKD	DKD

<sup>a</sup>Staging may be confounded by treatment because RAS blockade could render microalbuminuric patients normoalbuminuric and macroalbuminuric patients microalbuminuric. Thus, although staging is done according to the current level of albuminuria for practical reasons, the implication of the staging undoubtedly is affected by past history. Therefore, when available, data before the initiation of therapy should be considered for classification purposes.  
<sup>b</sup>Because patients with diabetes often have elevated GFR in the early years after diagnosis, GFR less than 90 mL/min may represent a significant loss of function. Kidney biopsy in these patients can show histological evidence of DKD. Patients with diabetes at increased risk of DKD include those with poor glycemic control, longer duration, hypertension, retinopathy, high-normal albuminuria, nonwhite race, family history of hypertension, CVD, type 2 diabetes, and DKD.  
<sup>c</sup>Reduction in GFR in patients with diabetes and normoalbuminuria is well described in both type 1 and type 2 diabetes; kidney biopsy in such patients often shows evidence of diabetic glomerulopathy. However, in the absence of histological evidence, these patients should be considered to have diabetes and CKD, which may require further investigation.  
 Abbreviations: RAS, renin-angiotensin system; CVD, cardiovascular disease.

**Reference:** National Kidney Foundation. KDOQI™ Clinical Practice Guidelines and Clinical Practice Recommendations for Diabetes and Chronic Kidney Disease. Am J Kidney Dis 49:S1-S180, 2007 (suppl 2).

**National Kidney Foundation**

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## **The “gold standard” for urine albumin testing = UACR**

### 1. Urine Albumin: Creatinine Ratio (UACR)

- UACR measures Albumin excretion in: mg albumin/g creatinine.
- Run on a spot urine sample; timed samples not necessary
  - (a) This test accounts for variation in urine concentration.
- Good at assessing any level of proteinuria.
- Values can be used for screening, diagnosing, and monitoring interventions, for guiding therapy.
- Requires lab analysis; there is currently no POC test.