

Screening for Albuminuria 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 may 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 (GFR) alone can only detect stages 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 Albuminuria?

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

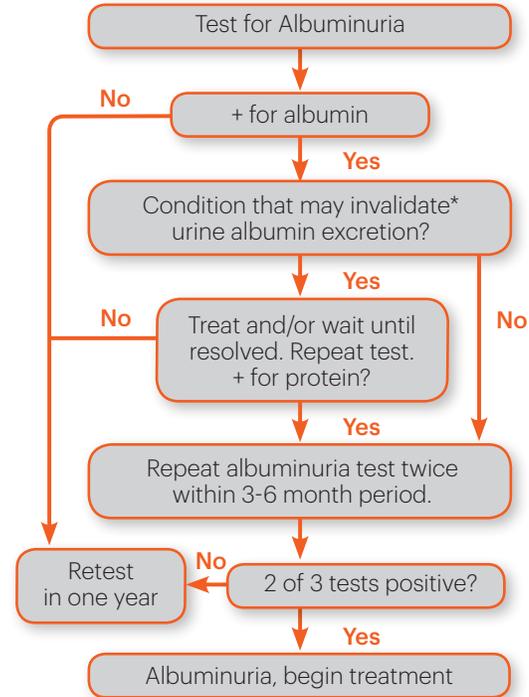
Terms

Normal to mildly increased
Moderately increased*
Severely increased[†]

Spot (mg/g creatinine)

<30
30-300
>300

How?



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

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Is it Diabetic Kidney Disease (DKD)?

Chronic Kidney Disease (CKD) should be attributable to diabetes if:

- Albuminuria is at severely increased levels (>300 mg/g creatinine)
- Albuminuria is at moderately increased levels (30-300 mg/g creatinine)
 - in the presence of diabetic retinopathy
 - in type 1 diabetes of at least 10 years' duration

Albuminuria

GFR (mL/min)	CKD Stage*	Normal to mildly increased	Moderately increased	Severely increased
>60	1 + 2	At risk [†]	Possible DKD	DKD
30-60	3	Unlikely DKD [‡]	Possible DKD	DKD
<30	4 + 5	Unlikely DKD [‡]	Unlikely DKD	DKD

* Staging may be confounded by treatment because RAS blockade could render patients with normal, mildly increased, moderately increased, or severely increased albuminuria to appear to have "moderately increased" levels. 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.

† 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.

‡ Reduction in GFR in patients with diabetes and normal to moderately increased albuminuria (<30 mg/g creatinine) 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; DKD, diabetic kidney disease.

References: 1. KDOQI clinical practice guideline for diabetes and CKD: 2012 Update. *Am J Kidney Dis.* 2012;60(5):850-886.

2. Tuttle KR, Bakris GL, Bilous RW, et al. Diabetic kidney disease: a report from an ADA Consensus Conference. *Am J Kidney Dis.* 2014;64(4):510-533.

