

Urine Albumin Screening and Monitoring in Type 2 Diabetes

Albuminuria describes a condition in which urine contains an abnormal (high) amount of albumin. In people with type 2 diabetes, albumin is the primary protein excreted by the kidneys. Albuminuria is usually a marker of nephropathy and cardio vascular disease (CVD). High levels and/or a rapid rise in urine albumin may be a sign of serious kidney disease. Not all kidney disease in people with diabetes is diabetic nephropathy; consider other causes of kidney damage.

The “gold standard” for kidney testing in people with diabetes is Urine Albumin to Creatinine Ratio (UACR) and estimated Glomerular Filtration Rate (eGFR).

Assessing Urine Albumin in Type 2 Diabetes

1. **Screen:** Check UACR at diagnosis and yearly.
2. **Diagnosis:** Positive diagnosis of albuminuria is made when UACR is greater than 30mg/g on two separate occasions.
3. **Monitor:** Re-check UACR every year:
 - More frequent monitoring may be needed in patients with changing clinical status or after therapeutic interventions.
 - Do not monitor urine albumin in dialysis patients.

When You Should NOT Screen for Proteinuria:

- Do not screen for proteinuria if there are symptoms of urinary tract infection (UTI) or if a urine analysis (UA) is positive for leukocytes, nitrite, or red blood cells. Address these issues first, then screen for urine protein once resolved.
- Causes of false positives include: strenuous exercise within 24 hours, infection, fever, congestive heart failure (CHF), marked hyperglycemia, pregnancy, marked hypertension (HTN), UTI, and hematuria.

Management of Albuminuria

The following strategies should be implemented to reduce albuminuria, prevent/slow nephropathy progression, and lower the risk of CVD:

- Maximize angiotensin-converting enzyme (ACE) Inhibitor/angiotensin receptor blocker (ARB)
- Stop smoking
- Protein restriction (later stages)
- Blood pressure control
- Lipid control
- Glucose control

Repeat UACR to monitor effectiveness of intervention; a decrease in urine albumin is therapeutically significant.

Urine Albumin Tests

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

- UACR measures albumin excretion in: mg albumin/g creatinine.
- The test is run on a spot urine sample; timed samples are not necessary. This test accounts for variation in urine concentration.
- UACR is good at assessing any level of proteinuria.
- Values can be used for screening, diagnosing, and monitoring interventions, and for guiding therapy.
- UACR testing requires lab analysis. There is currently no point-of-care (POC) test.

*The “gold standard” for urine albumin testing is the UACR.

*Other Urine Protein Tests***

****Note: These other urine protein tests are not recommended for assessing albuminuria.**

2. Urine Protein: Creatinine Ratio (UPCR):
 - UPCR is not sensitive for early detection and is not standardized.
3. 24-hour urine collection for protein:
 - This test is labor-intensive for patients and it is difficult to get a complete and accurate sample.
 - It is no more effective than simpler tests such as UACR for diabetic nephropathy.
4. Microalbumin: Creatinine strips (e.g. Clinitek):
 - Results may look like UACR (mg albumin/g creatinine) but are less accurate.
 - Local lab test names vary widely; talk with *your* lab on how to order a UACR (and not a test strip).
5. Microalbumin strips (e.g. Micral):
 - These strips are less accurate than UACR.
 - Results are measured in mg albumin/L.
6. UA dipstick:
 - This test only detects higher levels of proteinuria (> 300mg/g).
 - It is not precise and cannot be used to assess or monitor albuminuria in type 2 diabetes.

Note: This year’s Diabetes Care and Outcomes Audit will still count any type of urine protein screening, but UACR is preferred.

“Albuminuria” is a continuous variable; the terms “microalbuminuria” and “macroalbuminuria” are going out of use.

Since these terms are still used for ICD9 Coding:

- “Normal” is less than 30mg/g.
- “Microalbuminuria” is 30 to 300mg/g.
- “Macroalbuminuria” is greater than 300mg/g.