

Renal Monitoring

Microalbuminuria:

- Excess albumin in the urine but not detectable using protein dipstick.
- The earliest indicator of renal disease (nephropathy).
- Is predictive of total mortality, cardiovascular mortality and cardiovascular morbidity.

Proteinuria (or macroalbuminuria):

- Is an important finding in patients with type 1 and type 2 diabetes
- Represents progression of urine albumin excretion from microalbuminuria
- Is associated with a high probability of progressive renal impairment due to diabetic nephropathy and an increased risk of macrovascular disease
- An albumin:creatinine ratio >30mg/mmol is overt proteinuria

Renal monitoring for patients with diabetes

- Annual urine dipstick test for protein (Boehringer 5L or Albustix test strips).
- If urine dipstick positive for protein, measure urinary albumin:creatinine ratio (ACR).
- Annual serum creatinine and estimation of GFR

Microalbuminuria laboratory screening

10ml early morning 'first pass' urine sample in a 'Universal' specimen container.
Clinical chemistry form for albumin/creatinine ratio ('ACR' in mg/mmol).

Male	Female	Interpretation	Action
<2.5	<3.5	Normal	Repeat in 1 year
≥2.5	≥3.5	Possible microalbuminuria	Repeat test at the next two clinic appointment and within 3-4 months, and microalbuminuria is confirmed if at least one out of two or more results is also abnormal

Renal Management for Patients with Diabetes

Routine management

- Maintain good blood glucose control
- Maintain good blood pressure control see algorithm on next page
- Stop smoking
- Advice on salt, exercise
- Immunize against influenza and pneumococcus
- Drug reviews

Persistently raised ACR or proteinuria

- Maintain good blood glucose control (HbA1c < 53 mmol/mol [7.0%] if possible).
- Maintain good blood pressure control (target < 130/80 mmHg for microalbuminuria, <125/75 if proteinuria >1g – ACR >100mg/mmol).
- Start ACE inhibitor or ARB
- Check eGFR +7-10 days after starting/dose change
- Use combination anti-hypertensive therapy to reach target.
- Manage CV risk factors aggressively

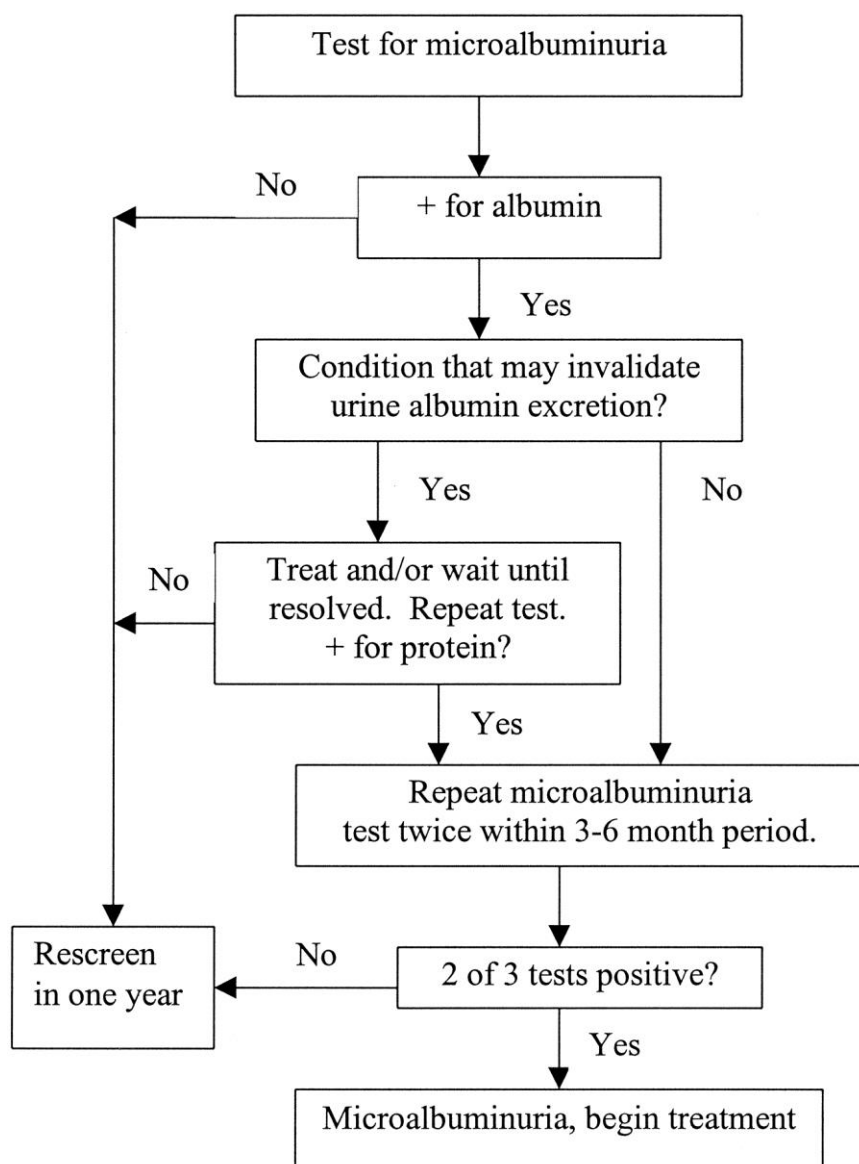
Referral is advised:

- To investigate for non-diabetic renal disease – suspect if: Heavy proteinuria/nephrotic syndrome with short duration diabetes +/- little or no retinopathy +/- haematuria/microscopic haematuria
- Raised creatinine with little or no proteinuria
- Rise in creatinine >30% or fall in estimated GFR >25% following initiation of ACE/ARB (possible renovascular disease)
- Possible systemic illness (eg vasculitis/myeloma)
- Acute renal failure

For management of:

- Persistent fluid retention
- Hypertension
- Secondary hyperparathyroidism
- Rapidly declining GFR > 15 ml/min within 12 months, irrespective of CKD stage
- GFR <30mls/min (CKD stage 4)
- Hb<10g/dl in absence of any other cause for anaemia apart from chronic kidney disease

Renal Disease Screening Algorithm



American Diabetes Association Dia Care 2004;27:s79-s83

Conditions that may affect urine albumin

Exercise, High BP, High protein diet, Fever, UTI, CCF, Menstruation, Pregnancy

Management

Optimise glycaemic control

Check serum creatinine. If normal then check annually.

Referral if GFR <30mls/min or sustained decrease in GFR \geq 25% and a change in GFR category or sustained decrease in GFR of \geq 15mls/min within 12 months

Optimise BP control. Targets: sBP 130mm Hg (target range 120-129 mm Hg) and dBP 80mm Hg

Drugs of choice ACE-I **or** ARB (**not** in combination), followed by long acting calcium channel blockers (avoiding short acting dihydropyridine calcium channel blockers such as nifedipine)

Manage the other cardiovascular risk factors aggressively