

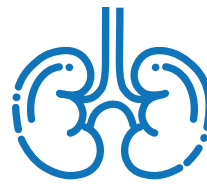
TYPE 2 DIABETES AND DIABETIC KIDNEY DISEASE



It is predicted that **5 million** people in the UK will have type 2 diabetes (T2DM) by 2025¹



Chronic Kidney Disease (CKD) refers to kidney disease of any aetiology, including non-diabetes related causes



Diabetic nephropathy or diabetic kidney disease (DKD) is characterised by gradually increasing urine albumin excretion over many years²



50% of people with diabetes will develop chronic kidney disease, between **20 to 40%** of these people have diabetic kidney disease³



Patients with DKD have **exceptionally high rates** of cardiovascular morbidity and mortality and are more likely to die from CVD than progress to ESRD⁴



Kidney failure in people with T2DM in the UK costs an estimated **£379 million** (2010-11). This cost is expected to rise to **£635 million** by 2036-6⁵

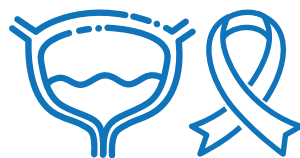


The care of people with T2DM and DKD encompasses:

- Glycaemic, blood pressure and lipid management
- Lifestyle and physical activity, smoking cessation, the renal and diabetes diet, regular foot assessment, and aspirin to reduce cardiovascular risk⁶



The diagnosis of stages of DKD are assessed using 2 methods: **eGFR** and **urinary albumin creatinine ratio (UACR)**



The measurement of UACR can add to the evidence base when considering if the individual has developed kidney disease as a result of their T2DM or not



UACR detects damage earlier than eGFR. Albuminuria occurs gradually over many years, in conjunction with slowly rising blood pressure and declining eGFR.



38% of patients with T2DM haven't had a UACR test within the last year^{7,8}

CLASSIFICATION

Prognosis of CKD by GFR and albuminuria categories⁸:

GFR categories (mL/min/1.72 m ²) Description and range	Persistent albuminuria categories - Description and range			Risk		
	A1	A2	A3	A1	A2	A3
G1	Normal or high	≥90	<30 mg/g <3 mg/mmol	Low risk	Increased risk	High risk
G2	Mildly decreased	60-89	30-300 mg/g 3-30 mg/mmol	Low risk	Increased risk	High risk
G3a	Mildly to moderately decreased	45- 59	>300 mg/g >30 mg/mmol	Increased risk	High risk	Very high risk
G3b	Moderately to severely decreased	30- 44		High risk	Very high risk	Very high risk
G4	Severely decreased	15-29		Very high risk	Very high risk	Very high risk
G5	Kidney failure	<15		Very high risk	Very high risk	Very high risk

⚠ When reviewing this table consider: An individual with G1-A3 has the same same risk as G3b-A1 so eGFR alone will not detect kidney damage early therefore it is vital that eGFR and UACR are completed.

IMPORTANT ISSUES RELATING TO TESTS

eGFR

- Blood test as part of U&Es
- Report depends on assay (Result should show actual number not just > 60 mL/min)
- Person needs to be well hydrated
- Advise low protein meal night before test

UACR

- ⬆ Early morning urine sample - **if no sample is brought a random can be used for the initial assessment. If sample shows a raised UACR repeat as for early morning**
- Before any activity (including sex)
- No indication of infection (Check prior to sending to lab)

THE SIGNIFICANCE OF UACR AND EGFR:

- ⬆ Increased UACR is associated with increased adverse outcomes
- ⬇ Decreased eGFR is associated with an increased risk of adverse outcomes
- ⬆⬇ Increased UACR and decreased eGFR multiplies the risk of adverse outcomes
- ⌚ The UACR should be tested annually and more often depending on latest eGFR and UACR

⚠ CAUTION!

The eGFR equation is only an estimate & is **not** accurate for use in:

- Children
- Acute renal failure
- Pregnancy
- Malnourished patients - For adults 90% of GFRs estimated by change to Modification of Diet in Renal Disease are accurate to within 30% of true value^{9,10}
- Muscle wasting disease states - (N.B. reduced muscle mass will lead to overestimation and increased muscle mass to underestimation of the GFR)
- Oedematous states
- Amputees

POTENTIAL CAUSES OF CHRONIC KIDNEY DISEASE¹¹

➤ Type 1 or type 2 diabetes
➤ Recurrent urine infection
➤ Hypertension
➤ Interstitial nephritis
➤ Glomerulonephritis
➤ Autosomal dominant polycystic kidney disease (ADPKD)
➤ Prolonged obstruction of the urinary tract, from conditions such as enlarged prostate, kidney stones and some cancers
➤ Vesicoureteral reflux, where urine is forced backed into the kidneys when the bladder contracts
➤ Prolonged use of specific medications including non steroidal anti-inflammatory agents (NSAIDs) calcineurin inhibitors, lithium and, NSAIDs

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