

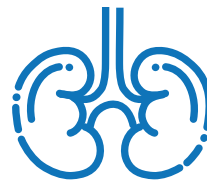
# TYPE 2 DIABETES AND DIABETIC KIDNEY DISEASE



It is predicted that **5 million** people in the UK will have type 2 diabetes (T2DM) by 2025<sup>1</sup>



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 years<sup>2</sup>



**50%** of people with diabetes will develop chronic kidney disease, between **20 to 40%** of these people have diabetic kidney disease<sup>3</sup>



Patients with DKD have **exceptionally high rates** of cardiovascular morbidity and mortality and are more likely to die from CVD than progress to ESRD<sup>4</sup>



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 2035-6<sup>5</sup>

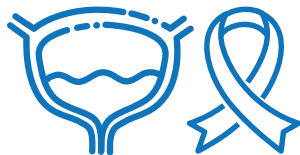


The care of people with T2DM and DKD encompasses:

- 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 risk<sup>6</sup>



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<sup>7,8</sup>

# CLASSIFICATION

Prognosis of CKD by GFR and albuminuria categories<sup>8</sup>:

				Persistent albuminuria categories - Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-300 mg/g 3-30 mg/mmol	>300 mg/g >30 mg/mmol
GFR categories (mL/min/1.72 m <sup>2</sup> ) Description and range	G1	Normal or high	≥90	Low risk	Increased risk	High risk
	G2	Mildly decreased	60-89	Low risk	Increased risk	High risk
	G3a	Mildly to moderately decreased	45- 59	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<sup>9,10</sup>
- 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 DISEASE<sup>11</sup>

➤ 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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