

CKD.

Chronic kidney disease is a kidney abnormality that persists for more than 3 months. Persons with a normal GFR may have CKD if they have persistent proteinuria or hematuria of renal origin.

1 kidney = CKD.

### Definition

Chronic kidney disease (CKD), also known as chronic renal failure, is defined as abnormalities of kidney structure or function, present for  $\geq 3$  months, with implications for health.

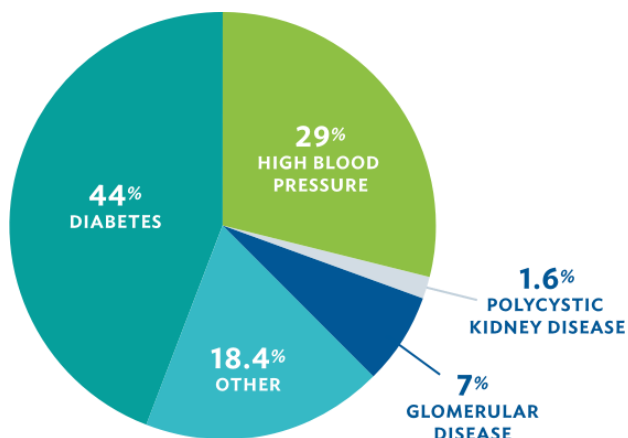
This means a glomerular filtration rate less than 60 mL/minute/1.73 m<sup>2</sup>, or the presence of one or more of the following markers of kidney damage: albuminuria/proteinuria, urine sediment abnormalities (e.g., haematuria), electrolyte abnormalities, abnormalities detected by histology, structural abnormalities detected by imaging, or history of kidney transplantation

### GP role.

- Recognise & monitor.
- Inform.
- Reduce risk - BP, bones, anaemia.DM if relevant.
- Refer.

### Causes.

- DM.
- HTN.
- GN.
- Obstructive.
- Meds.
- PCOS.



Around one third of adults with CKD have a positive family history of CKD.

### How to calculate GFR.

Use only for stable CKD.

Creatinine (waste product)

affected by creatine. Muscle mass. Exercise. Height. Supplements. Trimethoprim can increase creatinine.

Creatinine range – 60-100

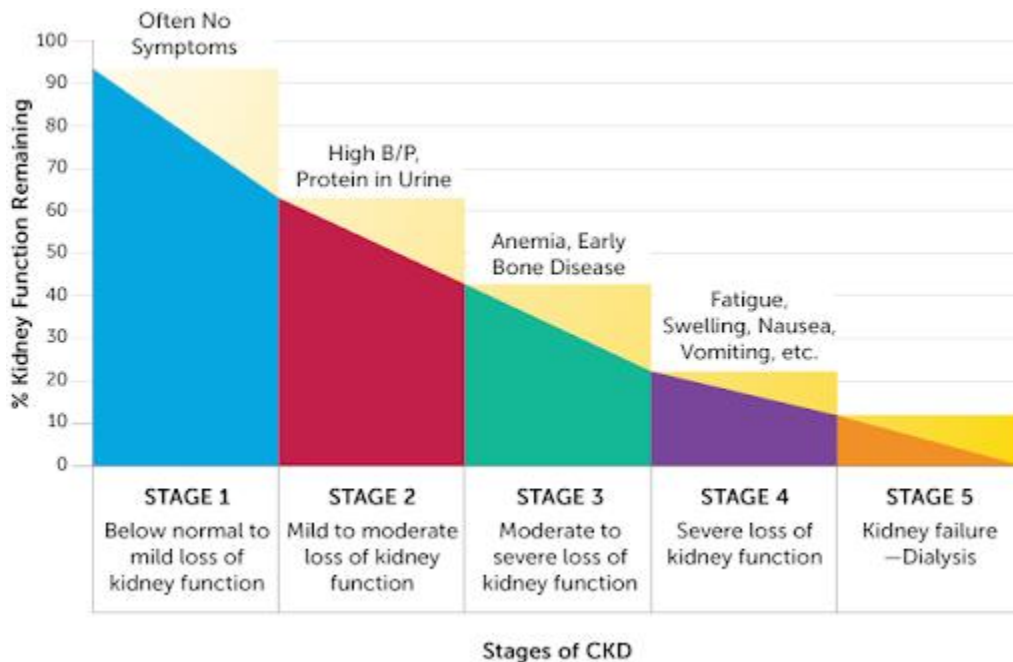
To calculate eGFR.

- CKD-Epi
- **MDRD.**
- Creatinine Clearance (Cockcroft-Gault Equation) CrCl

### ACR.

Urinary Albumin to Creatinine ratio ( ACR) good test in DM. Can be used in CKD, IHD, HTN.

A spot urine protein to creatinine ratio should be obtained periodically, with a ratio of 3.0 or more suggesting a higher risk of CKD progression.



## Heat Map.

### Calculate G (1-5) and A ( 1-3).

Glomerular filtration rate (GFR) category is based on GFR (mL/minute/1.73 m<sup>2</sup>):

G1 GFR ≥90: normal or high

G2 GFR 60 to 89: mildly decreased


G3a GFR 45 to 59: mildly to moderately decreased


G3b GFR 30 to 44: moderately to severely decreased

G4 GFR 15 to 29: severely decreased

G5 GFR <15: kidney failure.

GFR and ACR categories and risk of adverse outcomes			ACR categories (mg/mmol), description and range		
			<3 Normal to mildly increased	3–30 Moderately increased	>30 Severely increased
			A1	A2	A3
GFR categories (ml/min/1.73m <sup>2</sup> ), description and range	≥90 Normal and high	G1	No CKD in the absence of markers of kidney damage	Yellow	Orange
	60–89 Mild reduction related to normal range for a young adult	G2		Yellow	Orange
	45–59 Mild–moderate reduction	G3a	Yellow	Orange	Red
	30–44 Moderate–severe reduction	G3b	Orange	Red	Red
	15–29 Severe reduction	G4	Red	Red	Red
	<15 Kidney failure	G5	Red	Red	Red


  
 Increasing risk


  
 Increasing risk

Kidney Disease: Improving Global Outcomes (**KDIGO**) classification

KDIGO classifies CKD based on cause (C), glomerular filtration rate category (G), and albuminuria category (A).

**Put on CKD register.  
Vaccinate.**

**Review** – how often?  
G3 & G4 – 6/12.  
G5 – 3/12.

**The Kidney Failure Risk Equation** – combines eGFR and ACR. Calculate risk.

Cardiovascular control – BP / chol / smoking / diet.

**BP control.**

Most vital step.

< 140/90.

If ACR > 70 – 130/80.

Angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin II receptor blockers (ARBs) may slow the progression of CKD, especially in patients with proteinuria.

Worsening blood pressure or renal function on initiation of an ACEI or ARB may also suggest renal artery stenosis.

SGLT2 inhibitors protect the kidneys and reduce the risk of death from cardiovascular disease – in CKD with / without proteinuria.

ACE-/ ARB and SGLT2 with cause acute dip in eGFR. Traditionally, an increase in serum creatinine level by up to 30% from baseline is considered acceptable. Watch increase in K+.

**Statins** for all G3 and G4

**Renal bone disease.**

Patients with progressive CKD are at risk of renal osteodystrophy.

Phosphorus, calcium, and parathyroid hormone levels should be monitored closely in all patients with stage G 4 CKD ( eGFR < 30).

Abnormalities in these values may indicate the need for dietary phosphate restriction, administration of oral phosphate binders or the administration of vitamin D.

Phosphate-Containing Bowel Preparations Should Be Used With Caution. Use macrogol. Bowel prep re colonoscopy – be wary.

Patients With Severe CKD Should Avoid Magnesium- or Aluminum-Containing Oral Preparations.

Cholecalciferol if G1-3  
Alfacalcidol if G4 – G5.

### **Anaemia.**

Guideline for the treatment of anemia of CKD recommends that the hemoglobin target should be between 11 and 12 g/dL and not above 13g/dl.

Anemia in Patients With CKD Should Be Treated With Erythrocyte-Stimulating Agents Such as Recombinant Human Erythropoietin But Should Not Be Overtreated.

eGFR < 30 then anaemia likely to be CKD.

### Indications for Renal US.

- Rapid progression.
- IVH.
- Fhx PCKD.
- Obstruction.
- G4+

### Referral criteria to nephrology.

- PCOS.
- Renal artery stenosis suspected.
- BP not controlled on 4 meds.
- Kidney failure risk equation of > 5% in 5 years.
- Rapid decline in eGFR – drop of 15 in 1 year or less.

**We can slow rate of decline with BP control / meds.**

### Causes of death in ESRD-HD.

