

Chronic kidney disease

DIAGNOSIS

WHO SHOULD BE TESTED FOR CKD

Offer testing for CKD using eGFR, serum creatinine and urinary ACR to people with any of the following risk factors:

- diabetes
- hypertension
- acute kidney injury
- cardiovascular disease (ischaemic heart disease, chronic heart failure, peripheral vascular disease or cerebral vascular disease)
- structural renal tract disease, kidney stones or prostatic hypertrophy
- multisystem disease eg. systemic lupus erythematosus
- family history of end-stage kidney disease (GFR category G5) or hereditary kidney disease
- Lithium or calcineurin inhibitors (eg cyclosporin or tacrolimus)

INTERPRETING eGFR VALUES

estimated GFR is a less reliable marker of true GFR (or true kidney function) when:

- eGFR > 60 ml/min/1.73 m²
- in extremes of body weight:
 - in patients with high BMI true GFR is higher than eGFR
 - in patients with low BMI true GFR is lower than eGFR

Confirm an eGFR result of less than 60 ml/min/1.73 m² in a person not previously tested by repeating the blood test

Allow for biological and analytical variability of serum creatinine (\pm 5%) when interpreting changes in eGFR

Correct eGFR for black ethnicity based on local laboratory guidance

CKD is defined as abnormalities of kidney structure or function, present for >3 months, with implications for health

CKD should be classified based on **cause**, GFR category, and albuminuria category

CLASSIFICATION OF CKD USING eGFR AND ACR CATEGORIES

(eGFR = estimated glomerular filtration rate; ACR = albumin creatinine ratio)

| eGFR and ACR categories and risk of adverse outcomes | | | | ACR categories (mg/mmol) | | |
|--|-----|--|---------|---|----------------------|--------------------|
| | | | | A1 | A2 | A3 |
| Based on KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease (Kidney International Supplements (2013) 3, 136-150) | | | | Normal to mildly increased | Moderately increased | Severely increased |
| | | | | < 3 | 3 - 30 | > 30 |
| eGFR categories (mls/min/1.73m ²) | G1 | Normal or high | > 90 | No CKD in the absence of markers of kidney damage | | |
| | G2 | Mild reduction related to normal range for a young adult | 60 - 89 | | | |
| | G3a | Mildly to moderately decreased | 45 - 59 | | | |
| | G3b | Moderately to severely decreased | 30 - 44 | | | |
| | G4 | Severely decreased | 15 - 29 | | | |
| | G5 | Kidney failure | < 15 | | | |

increasing risk

increasing risk

HAEMATURIA

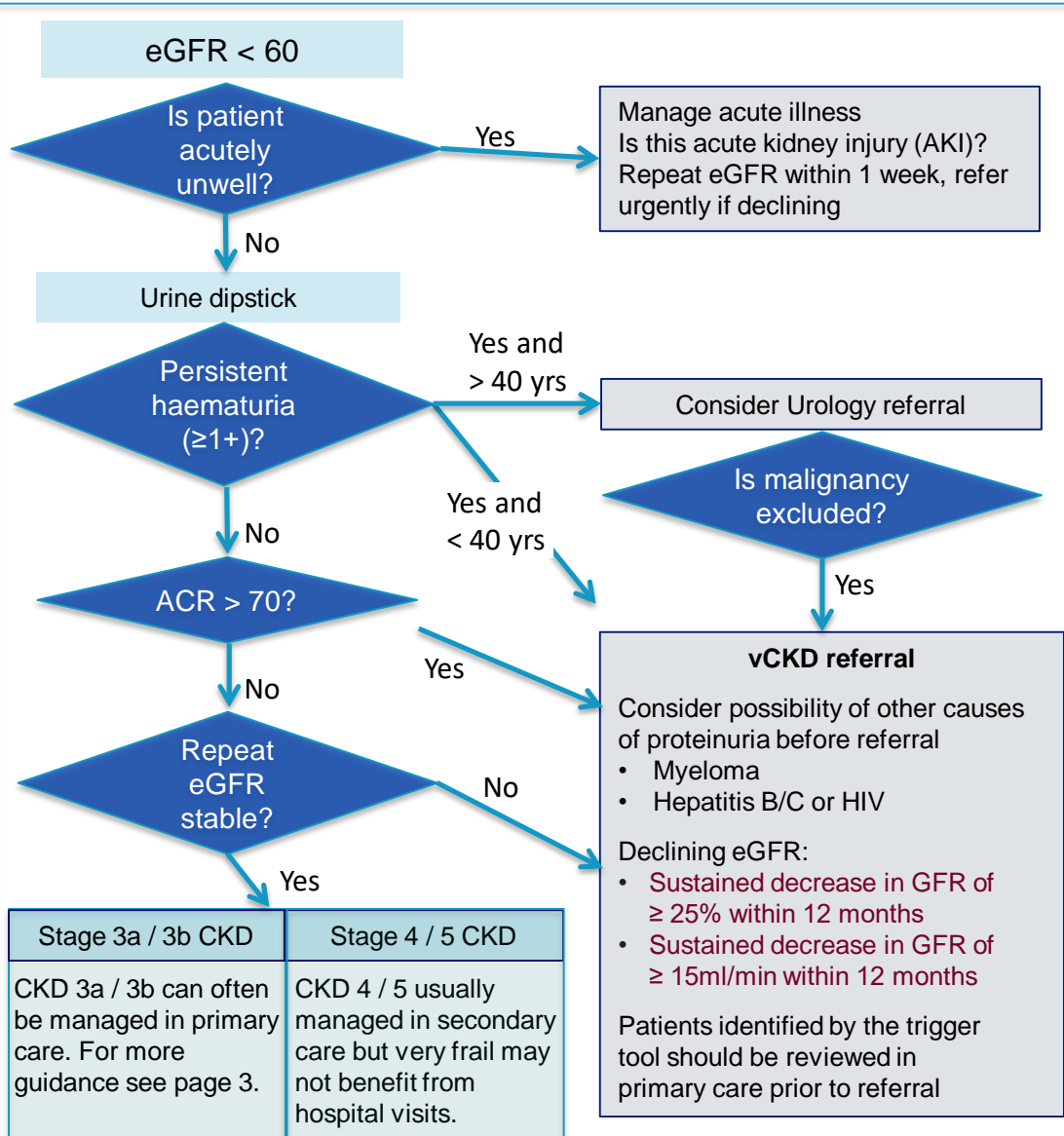
- Use dipstick reagent strips
- Evaluate further if there is a result of 1+ or more (rpt in 2 weeks)
- Dipstick haematuria is not diagnostically useful with concurrent menstrual period, infection or in catheter samples
- Consider urgent Urology referral if haematuria and > 40 years age
- Haematuria + proteinuria suggest glomerular disease likely

PROTEINURIA

- Proteinuria is a useful marker of kidney damage and complication risk
- ACR is the recommended method for assessing proteinuria
- If initial ACR = 3 – 70 mg/mmol confirm with a subsequent early morning sample
- If initial ACR > 70 mg/mmol a repeat sample is not needed
- Confirmed ACR \geq 3 mg/mmol signifies clinically important proteinuria

Chronic kidney disease REFERRAL

WHEN TO REFER TO NEPHROLOGY



URGENT REFERRAL

- If**
- Suspected multisystem disease with evidence of renal involvement
 - Stage 2 or Stage 3 acute kidney injury (without an obvious cause manageable in primary care)
 - eGFR < 15mls/min & not already known to renal
 - New onset nephrotic syndrome
 - Accelerated hypertension with acute fall in eGFR
 - Severe hyperkalaemia (K > 6.5 mmol/L)

Urgent referrals should be made by phone to:

Renal registrar on call: 020 3594 5626 (24 hours)

Nephrologist on call: 020 3594 5751 (Mon – Fri; 9 -5)

MINIMUM INFORMATION FOR REFERRAL

Please write your clinical question in the Consultation Text in EMIS & refer using vCKD or use A&G for System1 Practices

Please ensure the following are available in the patient record:

- Dates & results of previous creatinine / eGFR measurement
- Medical history
- Drug history
- Current BP
- Urine dipstick and ACR

Please request renal ultrasound if:

- Rapid progression of CKD
- Visible or persistent invisible haematuria
- Symptoms of urinary tract obstruction
- Family history of polycystic kidney disease
- eGFR of < 30 (eGFR category G4 or G5)

What is **cause** for CKD?

Seek nephrology advice via vCKD if cause is uncertain & eGFR is decreasing by more than 3mls/min/year

MANAGEMENT

MANAGEMENT OF STABLE CKD

Agree management plan with patient to include:

Lifestyle advice

- reduce salt intake
- normal healthy diet
- exercise
- maintain a healthy weight

Smoking cessation advice

- Avoid NSAIDs (even topical)
- Vaccinate for influenza and pneumococcus
- Blood pressure control
- Diabetes control
- Sick day guidance

Cardiovascular risk:

- Statins – all patients with CKD3b and beyond should be offered lipid-lowering medication unless contra-indicated

Serum bicarbonate

- Consider sodium bicarbonate 500mg twice daily if acidotic (serum bicarbonate <22 mmol/L)

RENAL ANAEMIA

Renal anaemia may develop in CKD 3b or CKD 4 and is common in CKD 5.

Patients with renal anaemia (Hb < 100 g/L) may benefit from treatment with intravenous iron and/or Erythropoietin via the vCKD service.

Renal anaemia should only be diagnosed once other causes of anaemia are excluded such as iron deficiency / B12 deficiency / folate deficiency / GI bleed / haemolysis.

FREQUENCY of MONITORING USING eGFR AND ACR CATEGORIES

(eGFR = estimated glomerular filtration rate; ACR = albumin creatinine ratio)

| eGFR and ACR categories and risk of adverse outcomes with suggested frequency of monitoring (times per year) | | | | ACR categories (mg/mmol) | | |
|--|-----|--|---------|----------------------------|----------------------|--------------------|
| | | | | A1 | A2 | A3 |
| | | | | Normal to mildly increased | Moderately increased | Severely increased |
| Based on KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease (Kidney International Supplements (2013) 3, 136-150) | | | | < 3 | 3 - 30 | > 30 |
| eGFR categories (mls/min/1.73m ²) | G1 | Normal or high | > 90 | ≤ 1 | 1 | ≥ 1 |
| | G2 | Mild reduction related to normal range for a young adult | 60 - 89 | ≤ 1 | 1 | ≥ 1 |
| | G3a | Mildly to moderately decreased | 45 - 59 | 1 | 1 | 2 |
| | G3b | Moderately to severely decreased | 30 - 44 | ≤ 2 | 2 | ≥ 2 |
| | G4 | Severely decreased | 15 - 29 | 2 | 2 | 3 |
| | G5 | Kidney failure | < 15 | 4 | ≥ 4 | ≥ 4 |

increasing risk

increasing risk

BLOOD PRESSURE TARGETS

- CKD without diabetes & ACR ≤ 70 **BP < 140/90 mmHg**
- CKD with diabetes or ACR > 70 **BP < 130/80 mmHg**

Encourage home BP monitoring

May be appropriate to relax BP targets in frail elderly

TREAT PROTEINURIA

when: ACR > 70 mg/mmol
ACR > 30 mg/mmol if hypertensive
ACR > 3 mg/mmol if diabetic

- Start ACEi or ARB (not both) - aim for maximum tolerated dose
- Causes a reversible reduction in eGFR - stop if eGFR falls more than 25% from baseline
- Risk of hyperkalaemia - do not start if K > 5.0 mmol/l
- consider stopping if K > 6.0 mmol/L

- Repeat bloods 2 weeks after initiation or dose increase & seek advice via vCKD if any concerns

For more information <https://pathways.nice.org.uk/pathways/chronic-kidney-disease>