**Chronic kidney disease**

Early identification and management of chronic kidney disease in adults in primary and secondary care

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**Definition**

Defined as abnormalities of kidney function or structure present for more than 3 months, with implications for health. This includes all people with markers of kidney damage and those with a glomerular filtration rate (GFR) of less than 60ml/min/1.73 m² on at least 2 occasions separated by a period of at least 90 days.

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**Who should be tested for CKD?**

- Monitor GFR at least annually in people prescribed drugs known to be nephrotoxic, such as calcineurin inhibitors (e.g. ciclosporin or tacrolimus), lithium and non-steroidal anti-inflammatory drugs (NSAIDs)
- Test for CKD (eGFR, serum creatinine and urine ACR) in the presence of the following risk factors: diabetes, hypertension, acute kidney injury, cardiovascular disease, structural renal tract disease, recurrent renal calculi or prostatic hypertrophy, multisystem diseases with potential kidney involvement e.g. systemic lupus erythematosus, family history of end-stage kidney disease (GFR category G5) or hereditary kidney disease, opportunistic detection of haematuria

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**Measuring kidney function**

- For Afro-Carribean multiply eGFR by 1.159
- At extremes of muscle mass interpret eGFR with caution—e.g. body builders (high creatinine), amputees or muscle wasting disorders (low creatinine)
- Advise people not to eat any meat in the 12 hours before their blood test - meat raises creatinine
- Bloods must be processed within 12 hours of venepuncture

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**Reporting and interpreting GFR values**

- If GFR is greater than 90 ml/min/1.73m², use an increase in serum creatinine concentration of more than 20% to infer significant reduction in kidney function.
- Interpret eGFR values of 60ml/min/1.73 m² or more with caution, bearing in mind that estimates of GFR become less accurate as the true GFR increases
- Confirm an eGFR result of less than 60ml/min/1.73 m² in a person not previously tested by repeating the test within 2 weeks. Allow for biological and analytical variability of serum creatinine (+5%) when interpreting changes in eGFR

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**Accelerated progression of CKD**

Be aware that people with CKD are at increased risk of progression to end-stage kidney disease if they have either of the following:

- A sustained decrease in GFR of 25% or more and a change in GFR category within 12 months or
- A sustained decrease in GFR of 15 ml/min/1.73m² per year

Take the following steps to identify the rate of progression of CKD:

- Obtain a minimum of 3 GFR estimation over a period of not less than 90 days
- In people with a new finding of reduced GFR, repeat the GFR within 2 weeks to exclude causes of acute deterioration of GFR e.g. acute kidney injury or starting renin-angiotensin system antagonist therapy

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Risk factors associated with CKD progression
Work with people who have any of the following risk factors for CKD progression to optimise their health:
- Cardiovascular disease
- Proteinuria
- Acute kidney injury
- Hypertension
- Diabetes
- Smoking
- African, African-Caribbean or Asian family origin
- Chronic use of NSAIDs
- Untreated urinary outflow tract obstruction
- NSAID use – see below

Chronic use of NSAIDs may be associated with progression and acute use is associated with a reversible decrease in GFR. Exercise caution when treating people with CKD with NSAIDs over prolonged periods of time. Monitor the effects on GFR, particularly in people with a low baseline GFR and/or in the presence of other risks for progression.

Proteinuria
- Do not use reagent strips to identify proteinuria unless they are capable of specifically measuring albumin at low concentrations and expressing the result as an ACR
- To detect and identify proteinuria, use urine ACR in preference to protein
- For the initial detection of proteinuria, if the ACR is between 3 mg/mmol and 70 mg/mmol, this should be confirmed by a subsequent early morning sample. If initial ACR is 70 mg/mmol or more, a repeat sample need not be tested

Regard a confirmed ACR of 3 mg/mmol or more as clinically important proteinuria

Acute kidney injury and CKD
Monitor people for the development or progression of CKD for at least 2-3 years after acute kidney injury, even if serum creatinine has returned to baseline.

Haematuria
When testing for the presence of haematuria, use reagent strips rather than urine microscopy
- Evaluate further if there is a result of 1+ or more
- Do not use urine microscopy to confirm a positive result

Indications for renal ultrasound
Offer a renal ultrasound scan to all people with CKD who:
- Have accelerated progression of CKD
- Have visible or persistent invisible haematuria
- Have symptoms of urinary tract obstruction
- Have a family history of polycystic kidney disease and are aged over 20 years
- Have a GFR of less than 30 ml/min/1.73 m² (GFR category G4 or G5)
- Are considered by a nephrologist to require a renal biopsy
**Blood pressure targets**

- <140/90 (Qof <140/85)
- <130/80 in diabetes or ACR > 70

**Choice of antihypertensive agent in CKD**

Hypertension, no diabetes, ACR < 30mg/mmol (ACR categories A1 and A2) - follow NICE HT clinical guideline 127

Start with ACE inhibitor (or ARB if ACEi intolerant) for:
- Diabetes with ACR > 3mg/mmol (ACR category A2 or A3)
- HT with ACR ≥ 30mg/mmol (ACR category A3)
- ACR ≥ 70mg/mmol (start even if no hypertension)

**Following the introduction or dose increase of ACEi / ARB:**

U+E at 7 – 10 days

If either the eGFR decrease from pre-treatment baseline is less than 25% OR the serum creatinine increase from baseline is less than 30%  
Do not modify the dose, repeat U+E in 1-2 weeks

If the eGFR decrease is 25% or more, OR the change in serum creatinine is 30% or more:
- Investigate other causes such as volume depletion or concurrent medication e.g. NSAIDs
- If no other cause for the deterioration in renal function is found, stop ACEi / ARB or reduce to a previously tolerated dose, and add an alternative antihypertensive medication if required.

**Hyperkalaemia**

Stop ACEi / ARB if the serum potassium 6.0 or more; discontinue other drugs known to promote hyperkalaemia e.g. potassium-sparing diuretics, spironolactone, NSAIDs, beta-blockers. NB the product “Lo-Salt” for food flavouring is HIGH in potassium content
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**Frequency of monitoring**
Use the Table opposite to guide the frequency of GFR monitoring for people with, or at risk of CKD, but tailor it to the person according to:
- The underlying cause of CKD
- Past patterns of eGFR and ACR (but be aware that CKD progression is often non-linear)
- Comorbidities, especially heart failure
- Changes to their treatment (such as renin-angiotensin-aldosterone system (RAAS) antagonists, NSAIDs and diuretics)
- Intercurrent illness
- Whether they have chosen conservative management of CKD

**Referral criteria**
People with CKD in the following groups should normally be referred for specialist assessment:
- GFR less than 30ml/min/1.73 m² (GFR category G4 or G5) with or without diabetes
- ACR 70 mg/mmol or more, unless known to be caused by diabetes and already appropriately treated
- ACR 30 mg/mmol or more (ACR category A3), together with haematuria
- Sustained decrease in GRF of 25% or more and a change in GFR category or sustained decrease in GFR of 15ml/min/1.73 m² or more within 12 months
- Hypertension that remains poorly controlled despite the use of at least 4 antihypertensive drugs at therapeutic doses
- Known or suspected rare or genetic causes of CKD
- Suspected renal artery stenosis

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This table is taken from UKMi North West NICE Bites September 2014 No: 67
N.B. the eGFRcystatinC test is not currently available.