Derbyshire Medicines Management UPDATE

www.derbyshiremedicinesmanagement.nhs.uk

Chronic kidney disease

Updated: November 2021

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

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 (eGFR) of less than 60ml/min/1.73 m^2 on at least 2 occasions separated by a period of at least 90 days.

Who should be tested for CKD?

- Monitor eGFR 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, gout, 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 (eGFR category G5) or hereditary kidney disease, opportunistic detection of haematuria

Measuring kidney function

- 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

Reporting and interpreting eGFR values

- If eGFR is greater than 90 ml/min/ 1.73m^2, 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 m^2 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 m^2 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

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 eGFR of 25% or more and a change in eGFR category within 12 months or
- A sustained decrease in eGFR of 15 ml/min/1.73m^2 per year

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

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

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Risk factors associated with CKD progression

- Cardiovascular disease
- Proteinuria
- Acute kidney injury
- Hypertension
- Diabetes
- Smoking
-
- Untreated urinary outflow tract obstruction
- NSAIDs – avoid if eGFR less than or equal to 60 ml/min/1.73 m^2
  If they cannot be avoided monitor renal function 1–2 weeks after starting or increasing the dose of the NSAID, and then regularly thereafter depending on risk (at least annually)

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.

Practical tips for renal dosing - CARE if the drug has:

- high renal clearance e.g., gabapentin, pregabalin are 100% excreted unchanged
- active metabolites which are renally cleared e.g., morphine, allopurinol
- nephrotoxicity e.g., aciclovir causes acute tubular necrosis and renally cleared
- a narrow therapeutic range e.g., digoxin

Avoid accumulation:

- start low and titrate slow
- avoid MR preparations
- watch for side effects

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

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 to all people with CKD who have:

- accelerated progression of CKD
- visible or persistent invisible haematuria
- symptoms of urinary tract obstruction
- a family history of polycystic kidney disease and are aged over 20 years
- an eGFR of less than 30 ml/min/1.73 m^2 (eGFR cat G4 or G5)
- Are considered by a nephrologist to require a renal biopsy

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Blood pressure targets <140/90; <130/80 in ACR > 70

Choice of antihypertensive agent in CKD

Hypertension, no diabetes, ACR < 30mg/mmol (ACR categories A1 and A2) - follow NICE NG 136

Start with ACE inhibitor (or ARB if ACEi intolerant) for:

- Diabetes with ACR > 3mg/mmol (start even if no hypertension) (ACR category A2 or A3)
- Hypertension 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 week

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 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

SGLT2 inhibitors shown to reduce progression to end stage kidney disease, all-cause mortality, and hospitalisation for heart failure
As per NICE NG28 – for adults with CKD and type 2 diabetes already on optimised ACEi/ARB if tolerated
JAPC classification – **GREEN consultant/specialist initiation** for Empagliflozin, Dapagliflozin, Canagliflozin

NOACs – for renal monitoring use Creatinine Clearance rather than eGFR, and use actual body weight

Statins - Offer Atorvastatin 20mg for CKD patients with an eGFR <60ml/min/1.73m2 and adjust based on lipid modification guidelines

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GFR and ACR categories and risk of adverse outcomes, and Frequency of monitoring (no of times per year: ≤1 to ≥4)			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/1.73m²), description and range	≥90 Normal and high	G1	No CKD in the absence of markers of kidney damage ≤1	1	≥1
	60–89 Mild reduction related to normal range for a young adult	G2		1	≥1
	45–59 Mild–moderate reduction	G3a[1]	1	1	2
	30–44 Moderate–severe reduction	G3b	≤2	2	≥2
	15–29 Severe reduction	G4	2	2	3
	<15 Kidney failure	G5	4	≥4	≥4

Increasing risk

Increasing risk

[1] Consider using eGFRcystatinC for people with CKD G3aA1

Abbreviations: ACR, albumin:creatinine ratio; CKD, chronic kidney disease; GFR, glomerular filtration rate

Adapted with permission from Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group (2013) KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. Kidney International (Suppl. 3): 1–150

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

Frequency of monitoring

Use the Table opposite to guide the frequency of eGFR 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:

- eGFR less than 30ml/min/1.73 m^2 (eGFR 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 eGFR of 25% or more and a change in eGFR category or sustained decrease in eGFR of 15ml/min/1.73 m^2 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