Algorithm to guide the management of adult patients with chronic kidney disease (CKD) Stages 1 – 5

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NHS
Airedale, Bradford and Leeds

IMPORTANT For a formal diagnosis of stage 3 to stage 5 CKD, **two eGFR reading of <60** present on at least two occasions **more than 3 months apart**.

Intake of cooked meat can have a significant effect on serum creatinine concentration and eGFR. Clinician should ensure that CKD classification is based on eGFR results from samples taken either during fasting or on days when there has been no ingestion of cooked meat.

Is there evidence of active renal disease or acute renal failure? (see BOX 1)

YES → Consider referral to nephrologist or urologist for inpatient/urgent outpatient assessment

NO

Standard measures (see **BOX 2**)

Is eGFR <30mL/ min/ 1.73m^2?

NO

Repeat the eGFR within 2 weeks if no previous results

eGFR 31-40 mL/ min/ 1.73m^2

- Repeat eGFR/ electrolytes every **6 months**
- Standard measures (**see BOX 2**)
- Consider referral to nephrologist if eGFR < 30 mL/min/1.73^2 **or** eGFR reduction > 5 mL/min/1.73m^2 in 1 year **or** > 10 mL/min/1.73m^2 in previous 5 years.

YES

Repeat the eGFR within 2 weeks and consider referral to nephrologists (see **BOX 3**)

eGFR > 40 mL/ min/ 1.73m^2

- Repeat eGFR/ electrolytes (**6 monthly** if eGFR < 60, otherwise **12 monthly**)
- Standard measures (see **BOX 2**)
- Consider referral to nephrologist if eGFR < 30 mL/min/1.73^2 **or** eGFR reduction > 5 mL/min/1.73^2 in previous year, especially if: ACR ≥ 70 mg/mmol (PCR ≥ 100 mg/mmol) **or** ACR ≥ 30 mg/mmol (PCR ≥ 50 mg/mmol, urinary protein excretion ≥ 0.5/24hr) **plus** haematuria (click NCG 73 page 4)

ACR albumin:creatinine ratio (in urine)
PCR protein:creatinine ratio (in urine)
PCI protein:creatinine index = PCR x 10
If ACR ≥30 and < 70 mg/mmol (PCR ≥ 50 and < 100 mg/mmol), confirm result on an early morning urine sample
NCG NICE Clinical Guideline

BOX 1 – FEATURES OF ACTIVE RENAL DISEASE/ACUTE RENAL FAILURE

Are there features that cause particular concern e.g.:

- Oliguria
- Loin pain
- Hyperkalaemia (K > 7mmol/l)
- Haematoproteinuria **(urinalysis in all cases)** (click NCG 73 page 8)
- Lower urinary tract symptoms and signs (dysuria, obstructive symptoms)
- Acute systemic symptoms (rash, arthritis, vomiting, diarrhoea, rigors, confusion)
- Severe hypertension
- Nephrotic syndrome
- A repeat eGFR within 3 days **(to be performed if any of the above are present)** that is ≥ 5 mL/min/1.73m^2 lower than the previous estimate.

BOX 2 – STANDARD MEASURES

- Review medication usage (such as Over The Counter drugs e.g. NSAIDS) See Drug Dosing Adjustment guidance and BNF Appendix 3
- Urine culture if haematoproteinuria
- Renal ultrasound (click NCG 73 page 12)
- Monitor haemoglobin, ferritin, calcium, phosphate, PTH (and consider referral for EPO or if refractory hyperparathyroidism) (click NCG 73 page 13 and NCG 114) Initiation of Treatment for Renal Anaemia Service (ITRAS) (CKD Anaemia Pathway Checklist)

Hypertension

- Achieve BP < 140/90 **or** BP < 130/80 if diabetic or ACR ≥ 70 mg/mmol (monitor for postural symptoms)
- ACE or ARBs are first choice agents for diabetic patients with hypertension or microalbuminuria (click PACE link for diabetes), hypertensive non-diabetic patients with ACR ≥ 30 mg/mmol and all patients with ACR ≥ 70 mg/mmol. Uptitrate ACE or ARBs to the maximum tolerated therapeutic dose before adding in a second agent (click NCG 73 page 14 for eGFR / potassium monitoring advice)
- Consider aspirin / statins according to cardiovascular risk

Lifestyle advice

- Smoking cessation, alcohol reduction, salt restriction (avoid Losalt), optimise BMI Regular physical exercise – BEEP Exercise Referral scheme Tel: 01274 223910
- Immunisation – influenza / pneumonia

BOX 3 – REFERRAL TO NEPHROLOGIST

The key question is whether or not a nephrologist can 'add value' to the management of an individual patient with CKD, and this is clearly a function of CKD severity, CKD progression and the presence of co-morbid states.
In borderline cases a consultant opinion may be sought through sharing of the electronic patient record.
For all referrals the following information will be needed:

- Symptoms, relevant medical history, key examination findings
- Last 3 or more creatinine / eGFR results
- Renal ultrasound report if previously performed
- Urinalysis
- Blood pressure control
- Results of any tests that support a particular renal diagnosis (e.g. autoimmune serology)

The nephrologist may formulate a shared care follow-up plan for individual patients.

PATIENT GROUPS THAT REQUIRE ANNUAL SCREENING TO DETECT CHRONIC KIDNEY DISEASE (CKD)

	Read Code Version 2	Read Code CTV3
Hypertension	G2…%	XE0Ub%
Biventricular failure	G580.%	XE0V8%
Ischaemic heart disease	G3…%	XE2uV%
ACE inhibitor	bi…%	bi…%
Calcium Channel Blocker + ACE	bA…%	bA…%
ARB Inhibitor	bk6…%	x03j2%
Antagonist diuretics	bk3-bk5z	x03ls%
NSAIDS	bk7-bk9z	j2…%
Lithium	bkB%	d61…%
Diabetes mellitus	C10..%	C10..%
Polycystic kidney disease	PD11.%	PD11.%
Bladder outflow obstruction	K160.%	X30Nx%
Reflux nephropathy	K02..%	X30Hu
Recurrent UTIs	K1903 XEOeO%	K1903
Renal stone disease		UGY…%
Urinary diversion	7B11.%	7B11.%
Chronic glomerulonephritis	K02..%	XE0db%
Neuropathic bladder	K16VO.	X30Nj
Familial CKD (where evidence of increased incidence within individual families)	12F1. 12FC.	Xa4eP% X30lf%
Any other CKD Stage 1	1Z10.	XaLHG%
Stage 2	1Z11.	XaLHH%
Stage 3a	1Z15.	XaNbn%
Stage 3b	1Z16.	XaNbo%
Stage 4	1Z13.	XaLHJ%
Stage 5	1Z14.	XaLHK%
Peripheral vascular disease	G73..%	Xa0IV%
Cerebrovascular disease	G6…%	G6…
Incidental finding of haematoproteinuria		

SIGNIFICANCE OF eGFR VALUES

Stage	mL/min/1.73m^2	Frequency of testing
1 Normal GFR*	>90	annually and during intercurrent illness
2 Mild Impairment*	60 - 89	annually and during intercurrent illness

* The terms Stage 1 and Stage 2 CKD are applied only when there is a known structural abnormality (e.g. persistent asymptomatic proteinuria, microscopic haematuria or microalbuminuria in diabetics) or structural abnormality (as determined by renal ultrasound, e.g. polycystic kidneys)

If there is no such abnormality, eGFR of >59 is not regarded as abnormal

3a Moderate Impairment	45 - 59	6 monthly and during intercurrent illness
3b Moderate Impairment	30 – 44	6 monthly and during intercurrent illness

The suffix p may be added for patients with ACR ≥ 30 mg/mmol PCR ≥ 50 mg/mmol.
Patients with stage 3 CKD do not require automatic referral to nephrologist – refer to algorithm and BOX 3 for guidance.

4 Severe Impairment	15 – 29	3 monthly and during intercurrent illness
5 Established	<15	6 weekly and during intercurrent illness

ELDERLY PATIENTS

eGFR is not validated for over 75s, and it should be noted that there is a natural age related renal decline. Trends of decline are estimated at 1 mL/min/year from the age of 40 years. Referral of patients in this category should be based on clinical judgement including trend of decline in eGFR.

STAGING / CODING

- All patients should be staged and coded by each reading, noting that this may change as results change
- It is accepted good practice to inform patients about their CKD status and the implications for monitoring and treatment

KEY MESSAGES FOR PATIENTS

- All patients with CKD have an increased risk of developing heart disease and other diseases of blood vessels, including stroke. For many, this is more important than the risk of developing more serious kidney disease.
- Knowing that you have CKD can help reduce your risk of heart attack by prompting discussion about lifestyle issues and treatment of high blood pressure and high cholesterol.

USEFUL WEBSITES FOR PATIENT INFORMATION

UK National Kidney Federation
www.kidney.org.uk

The Renal Association Patients Pages
www.renal.org/Patients/Patients.html

British Kidney Patient Association
www.britishkidney-pa.co.uk

Published by NHS Bradford and Airedale. This guidance was updated in October 2011 through consensus opinion by local experts. It should be used in conjunction with the BMA CKD frequently asked questions, the Royal College of General Practitioners booklet 'Introducing eGFR' and the NICE Guidance CG73 (2008). This guidance does not, however, override the individual responsibility of the healthcare professional to make the decisions appropriate to the circumstances of the individual patient.

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