

Management of CKD

All stages – to include

- Regular clinical and laboratory assessment (see table overleaf)
- Advice on smoking, weight, exercise, salt & alcohol intake
- Cardiovascular prophylaxis: if risk >20% at 10 years consider
 - aspirin if BP <150/90 mm Hg
 - lipid lowering drugs (or entry into trial)
- BP monitoring by BHS methods at least once a year
- Meticulous BP control
 - threshold 140/90, target 130/80 mmHg in most patients
 - threshold 130/80, target 125/75 mmHg if urine PCR >100 mg/mmol
 - include ACEI or ARB if urine PCR >100 mg/mmol or
 - if diabetes and microalbuminuria present
 - + check creatinine and potassium - before starting and
 - 2 weeks after start and
 - after each dose change
 - + if creatinine increases by >20% or GFR falls by >15%
 - repeat with potassium and seek advice (?stop ? test for RAS)
- If potassium > 6 mmol/L - check no haemolysis and check diet
 - stop NSAIDs and LoSalt
 - stop K - retaining diuretics
 - stop ACEI/ARB if hyperkalaemia persists

CKD Stage 3: additional management to include

- If Hb <11 g/dL and other causes excluded
 - refer for IV iron +/- ESA with target Hb 11-12 g/dl
- Renal ultrasound if - lower urinary tract symptoms
 - refractory hypertension
 - unexpected fall in eGFR
- Immunise against influenza and pneumococcus
- Review all drugs - ensure correct dose
 - avoid nephrotoxic drugs eg NSAIDs if possible
- Check PTH level when stage 3 first diagnosed
 - if high check 25-hydroxy vit D & if low give ergo- or cole-calciferol with calcium supplement (not phosphate)
 - repeat PTH after 3 months and refer if still high

CKD Stages 4/5 : additional management*

- Dietary assessment
- Immunisation against hepatitis B
- Management of hyperparathyroidism
- Correction of acidosis
- Information about options for treatment
- Timely dialysis access procedure
- Referral/discussion even if dialysis may not be appropriate

*in conjunction with secondary care

List of sources of further information

This leaflet was prepared by Dr Steve Blades and Dr Richard Burden on behalf of the CKD Guideline Development Committee which included representatives from the Royal College of General Practitioners. The information is taken from 'UK Guidelines for Identification, Management and Referral of Chronic Kidney Disease in Adults'; the full version and a concise version as well as electronic guidance are available at:

www.renal.org/CKDguide/ckd.html

See also:

NSFs - Diabetes, Renal: www.dh.gov.uk National Kidney Federation: www.kidney.org.uk

Abbreviation Key:

ACEI	Angiotensin Converting Enzyme Inhibitor
ARB	Angiotensin Receptor Blocker
BHS	British Hypertension Society
CKD	Chronic Kidney Disease
ESA	Erythropoietin Stimulating Agent
LoSalt	(Potassium containing salt substitute)
NSAID	Non Steroidal Anti inflammatory Drug
PCR	Protein:Creatinine Ratio (best lab test for proteinuria)
PTH	Parathyroid hormone
RAS	Renal Artery Stenosis
RRT	Renal Replacement Therapy
SLE	Systemic Lupus Erythematosus

Minimum frequency of testing

CKD stage	Tests	Frequency
1 and 2	BP eGFR Urine PCR*	yearly
3	- also Hb, potassium calcium, phosphate	6 monthly (12 if stable **)
4 and 5	- also bicarbonate, PTH	3 monthly (6 if stable CKD stage 4 **)

* if dipstick protein present ** stable=<2mL/min change eGFR over 6months



Introducing eGFR

Promoting good CKD management

What is eGFR?

Glomerular filtration rate is the best measure of overall kidney function. It is normally around 100mL/min so the result roughly indicates the % of normal kidney function that someone has – a result of 45mL/min means the kidney function is about 45% of normal.

Measurement is difficult but it can be estimated (hence eGFR) by the laboratory from the serum creatinine, gender, and age. There are racial differences and eGFR should be multiplied by 1.2 for African-Caribbean patients (unless this correction has been made by the laboratory).

It doesn't apply to acute renal failure nor to children (< 18 years). It tends to underestimate the severity of renal failure in people with muscle wasting or an amputation.

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Why the change?

- Until recently the emphasis has been on patients needing dialysis or transplantation. It is now realised that less severe chronic kidney disease (CKD) is quite common.
- Serum creatinine on its own does not detect minor degrees of kidney impairment and isn't directly related to the GFR.
- eGFR forms the basis for the classification and management of CKD.
- CKD is an important risk factor for cardiovascular problems. eGFR makes it easier to tell who should be offered treatment to reduce the risk.
- eGFR makes it easier to work out which patients need to be referred for specialist investigation and treatment.

The 5 stages of Chronic Kidney Disease (CKD)

eGFR	STAGE
>90 mL/min with another abnormality* - otherwise regard as normal	= stage 1 CKD
60-89 mL/min with another abnormality* - otherwise regard as normal	= stage 2 CKD
30-59 mL/min (moderate impairment)	= stage 3 CKD
15-29 mL/min (severe impairment)	= stage 4 CKD
<15 mL/min (established renal failure)	= stage 5 CKD

*e.g already known to have proteinuria, haematuria (but no urological cause), microalbuminuria (in diabetes), polycystic disease or reflux nephropathy.

If eGFR 60 – 89 ml/min:

On its own this is not an indication for further testing and does not mean someone has CKD.

If eGFR <60 ml/min:

- Review all previous creatinine/eGFR results to assess rate of deterioration
- Review medication, particularly recent additions e.g. non-steroidal anti-inflammatory drugs (NSAIDs), antibiotics, mesalazine, diuretics, ACEIs/ARBs.
- Test urine for haematuria and proteinuria. If protein present request urine protein/creatinine ratio.
- Assess clinically: for urinary symptoms, palpable bladder, BP, sepsis, heart failure, hypovolaemia,
- Repeat serum creatinine measurement within 5 days to exclude rapid progression, if new finding.
- Check referral criteria: ensure entry into a chronic disease management programme if not indicated

Information needed on referral

- General medical history
- Urinary symptoms
- Medication
- Examination e.g. BP, oedema, bladder
- Urine dipstick for blood and protein
- Urine for PCR if proteinuria present
- Blood count
- Serum creatinine, urea, sodium, potassium, albumin, calcium, phosphate, cholesterol, HbA1c (in diabetes)
- All previous creatinine results with dates
- Result of renal ultrasound if available.

Criteria for referral

Stages 1/2

- Malignant hypertension (Urgent)
- Hyperkalaemia ($K^+ > 7$ mmol/L) (Urgent)
- Nephrotic syndrome (Urgent)
- Isolated proteinuria (protein:creatinine ratio (PCR) >100mg/mmol)
- Proteinuria and microscopic haematuria (PCR > 45 mg/mmol)
- Diabetes with proteinuria (PCR >100 mg/mmol) but no retinopathy
- Macroscopic haematuria (after negative urological evaluation)
- Recurrent pulmonary oedema with normal left ventricular function
- Fall of eGFR of >15% during first 2 months on ACEI / ARB

Stage 3

As above, plus:

- Progressive fall in GFR
- Microscopic haematuria (after negative urological tests if >50 years old)
- Proteinuria (urine protein:creatinine ratio > 45 mg/mmol)
- Anaemia (after exclusion of other causes)
- Persistently abnormal serum potassium, calcium, phosphate, (uncuffed sample)
- Suspected underlying systemic illness, e.g. SLE, vasculitis, myeloma
- Uncontrolled hypertension (e.g. BP > 150/90 on 3 agents)

Stages 4/5 (Urgent)

All patients should be referred or at least discussed formally with a nephrologist and offered the options of renal replacement therapy (RRT) or conservative therapy, even if it is not anticipated that RRT will be appropriate. Exceptions may include if the CKD is part of terminal illness or function is stable and relevant tests completed and appropriate management implemented with an agreed treatment plan.