STAGING AND MANAGEMENT OF CHRONIC KIDNEY DISEASE BY ESTIMATED GFR (EGFR) SUMMARY

The 2nd part of the National Service Framework for Renal Disease recommended that the management of kidney disease should be based on estimated glomerular filtration rate (eGFR). The eGFR is calculated using serum creatinine, but takes into account the patient's age, sex and ethnicity. It is a more accurate way of assessing kidney function than creatinine alone. eGFR is calculated using the 4v-MDRD equation and is reported with every serum creatinine result as part of the renal profile. It is only validated for Caucasian or African-Caribbean patients aged 18-70 (multiply eGFR by 1.21 in black patients). It is **NOT** validated in acute renal failure, pregnancy, oedematous states, muscle-wasting disorders, amputees, malnourishment and if age <18. It also tends to underestimate GFR in patients with near normal renal function (eGFR >60).

An eGFR of >60 does not indicate CKD unless there is additional evidence of renal disease (e.g. abnormal urinalysis). eGFR simplifies the management of kidney disease by enabling individuals to be categorised into 5 stages according to their level of kidney function (table). Most individuals in Groups 1-3 will not progress to end stage renal disease (ESRD) and the clinical priority is cardiovascular risk (i.e. control of BP, diabetes, cholesterol and smoking cessation). Exceptions are those with inherited kidney disease, difficult hypertension, microscopic haematuria, proteinuria or a deteriorating eGFR who should be referred for more specialist assessment. Individuals in Stage 4 & 5 are more likely to have complications such as anaemia and bone disease and will also require timely assessment for renal replacement therapy, including transplantation. Some patients may not wish to be considered for dialysis, but could still benefit from specialist supportive input for symptom management. If a patient is newly discovered to have a high creatinine (stages 2-4 CKD), they cannot be labelled as having CKD unless the creatinine is stable.

eGFR mL/min/ 1.73/ m^2	Stage*	Description & Prevalence (%)	Management
>90	1**	Normal 3.3%	Minimise cardiovascular risk. Refer if inherited kidney disease, microscopic haematuria or proteinuria (Urine Albumin/Creatinine ratio >70 mg/mmol *or* Protein/Creatinine ratio [PCR] >100 mg/mmol. Total daily excretion can be estimated from PCR 100 mg/mmol = 1000mg/day = 1 g/ day). Monitor annually.
60-89	2**	Mild reduction 3.0%	Minimise cardiovascular risk. Refer if inherited kidney disease, microscopic haematuria or proteinuria or change in eGFR from stage 1. Typically monitor annually.
45-59 30-44	3A 3B	Moderate 4.3%	Minimise cardiovascular risk. Refer if inherited kidney disease, difficult hypertension, microscopic haematuria or proteinuria or change in eGFR from stage 2. Monitor and treat complications (e.g. anaemia). Typically monitor 6 then 12- monthly.

15-29	4	Severe 0.2%	Refer (or discuss) if appropriate (based on extra-renal disease/co-morbidity). Minimise cardiovascular risk. Monitor and treat complications (e.g. anaemia and bone disease). Discuss plans for renal replacement therapy. Typically monitor 3-monthly.
0-14	5	Very severe/ ESRD 0.2%	Refer (or discuss) if appropriate (based on extra-renal disease/co-morbidity). Minimise cardiovascular risk. Monitor and treat complications (e.g. anaemia and bone disease). Prepare for imminent renal replacement therapy or conservative (non-dialysis) management. Typically monitor 6-weekly.

*** Use the suffix (p) to denote the presence of proteinuria when staging CKD.**
**** Other evidence of renal disease required (e.g. haematuria, proteinuria, genetic diagnosis of kidney disease, evidence of structural abnormality)**

When confirming eGFR staging for patients, they should be asked to avoid meat and vigorous exercise for 12 hours prior to blood sampling. Microscopic haematuria implies 2 positive test results in a 2 month period.

References and further information

1. NICE: Chronic Kidney Disease CG73, September 2008.

2. Department of Health. Estimating glomerular filtration rate (GFR) Information for laboratories. DH Publications. 2006; 1-2. Available from: http://www.doh.gov

3. Lamb E J, Tomson C R and Roderick. Estimating kidney function in adults using formulae. Ann Clin Biochem 2005;42: 321-345

4. The Renal Association [website]. [Revised January 2009, cited 7th June 2012]. Available from: http://www.renal.org/whatwedo/InformationResources/CKDeGUIDE/CKDstages.aspx