

Classification

Chronic kidney disease (CKD, chronic renal failure) is now staged according to the estimated glomerular filtration rate (eGFR). The eGFR is calculated from the age, gender and serum creatinine and will be reported alongside any creatinine measurement by the chemical pathology laboratory from early 2006. The normal range is > 90 ml/min/1.73m². The stages of CKD, along with their estimated prevalence, are as follows:

Stage	GFR (ml/min/1.73m ²)	Description	Population Prevalence (%)	READ Code
1	> 90 ¹	Kidney damage with normal or ↑GFR	3.3	1Z10
2	60-89 ¹	Kidney damage with mild ↓GFR	3.0	1Z11
3	30-59	Moderate ↓GFR	4.3	1Z12
4	15-29	Severe ↓GFR	0.2	1Z13
5	< 15	Kidney failure	0.2	1Z14

¹For a diagnosis of CKD to be made with a eGFR > 60 ml/min (ie stage 1 or 2 CKD), then other markers of kidney damage, either in terms of imaging or urinalysis (for example polycystic kidneys or microalbuminuria) are required.

eGFR and age

In healthy individuals the eGFR falls by up to 10 ml/min/1.73m² per decade beyond the age of 40 - BUT reduced eGFR is associated with cardiovascular risk for all ages

eGFR is not valid in: children, malnutrition and muscle wasting, pregnancy, acute renal failure, oedematous states

Measurement of protein excretion

- 24 hour protein estimations are no longer required. The total daily protein excretion (in mg) can be estimated simply by multiplying **the total protein-creatinine ratio, TPCR** (from a spot urine sample, preferably early morning, measured in mg/mmol) by a factor of 10.
- For example: Urine protein = 750 mg/l, urine creatinine = 7.5 mmol/l
So, total protein-creatinine ratio (TPCR) = 750/7.5 = 100 mg/mmol
Therefore daily protein excretion = 100 x 10 = 1000 mg, ie 1 g
- The **albumin-creatinine ratio** (preferable by early morning urine) is useful only in diabetes to diagnose microalbuminuria, the earliest stage of diabetic renal disease.

The need for guidelines

- CKD is extremely common, far more so than has been historically realised.
- However, most (up to 80%) patients, even with advanced renal impairment (stage 4) have stable disease, will never require dialysis, and often die of cardiovascular causes. They should be treated with aggressive BP control and management of cardiovascular risk.
- These guidelines are summarised from those issued by the Royal College of Physicians and the UK Renal Association (<http://www.renal.org/CKDguide/ckd.html>), and based on a template designed by Hugh Rainer, Birmingham Heartlands Hospital

Indications for measurement of annual serum creatinine

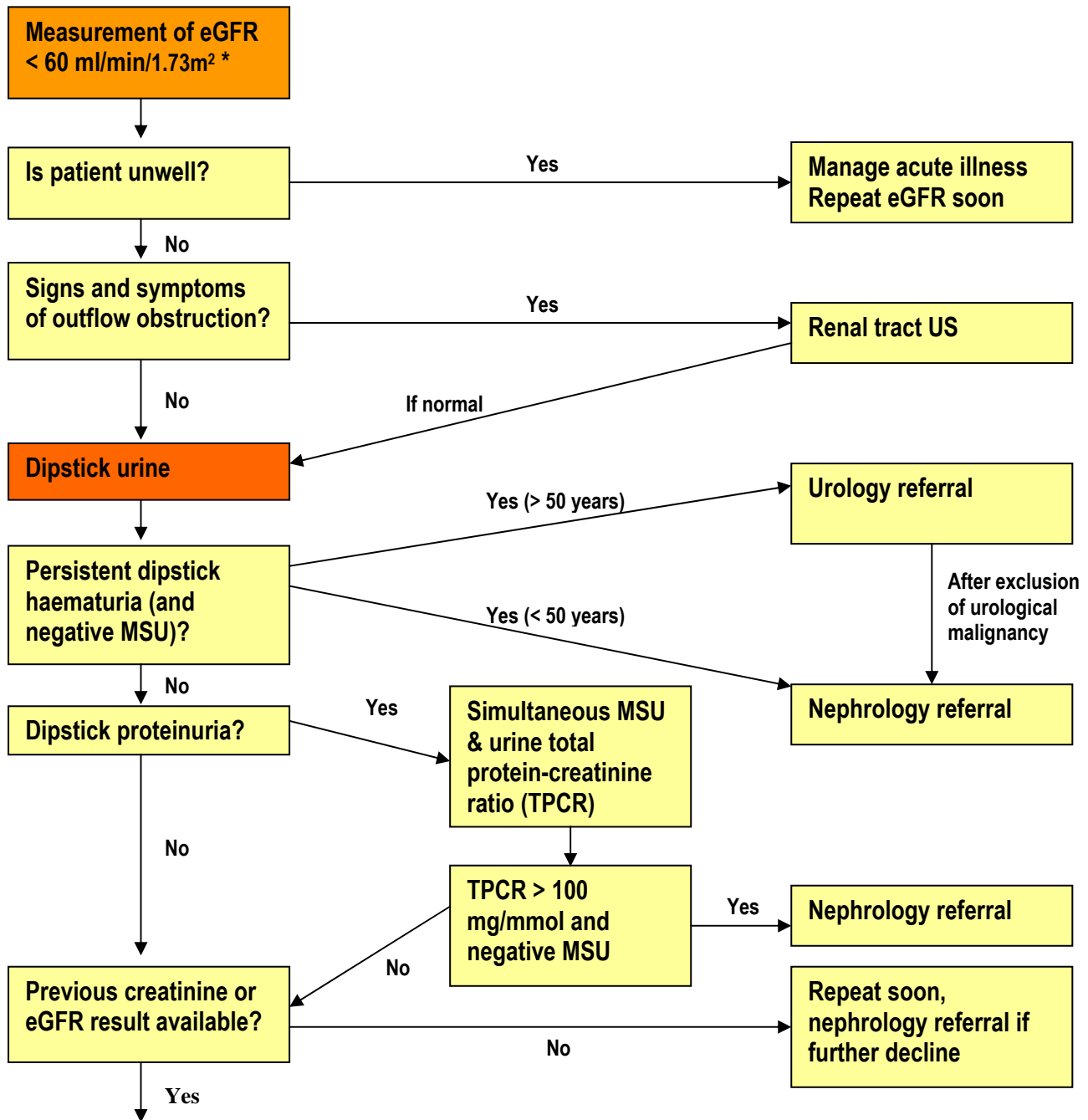
- **High risk of obstructive uropathy:** neurogenic bladder/urinary diversion/urine stone disease if underlying abnormality (oxaluria/cystinuria/anatomical abnormalities)
- **High risk of silent development of CKD:** hypertension / diabetes / heart failure / coronary, cerebral or peripheral vascular disease
- **Use of potentially nephrotoxic drugs:** ACEI / ARB / lithium / NSAIDs / mesalazine / ciclosporin
- **Multisystem disease that may involve the kidney**
- **A first degree relative with stage 5 CKD** (if stable after 3 years, then reduce frequency, eg every 3 years)

Information required for referral or letter of advice

We would kindly ask that, as a minimum, the following information be provided on any referral:

- List of dates and results of previous serum creatinine measurements to assess stability
- Past medical and drug history, record of blood pressure control, bloods (Hb, ferritin, Ca, Pi, PTH)
- Dipstick results, and total protein-creatinine ratio if more than trace protein present
- Renal US if stage 4, refractory hypertension, progressive decline in eGFR or lower tract symptoms

Algorithm for the management of a newly detected abnormal eGFR



TREAT AS CKD

ie according to algorithm on page 3 - most important features to assess are SEVERITY and STABILITY
Nephrology referral is indicated if:

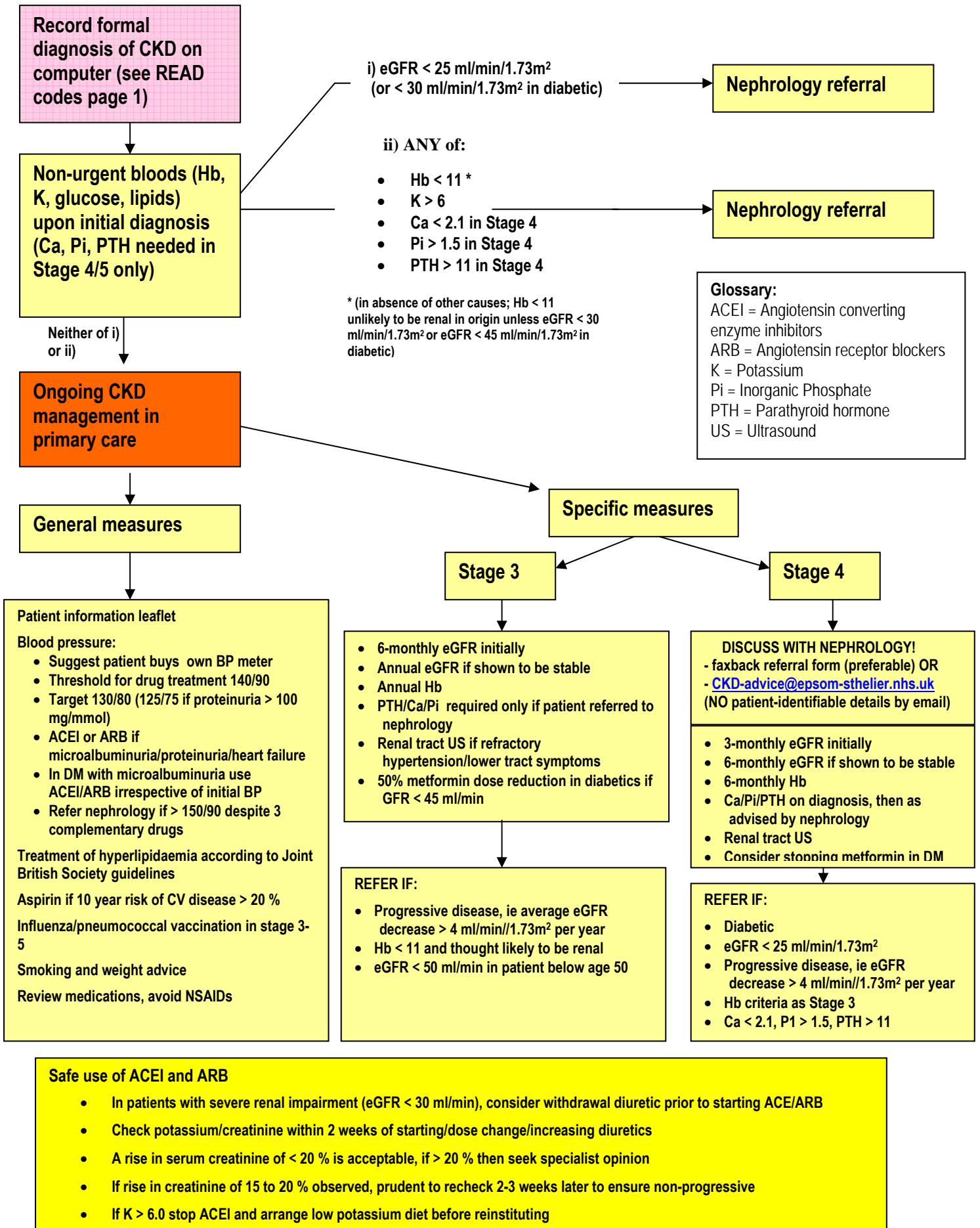
- Current eGFR < 20 ml/min/1.73m² (or < 30 ml/min/1.73m² if diabetic)
- Average fall in eGFR > 4 ml/min/1.73m² per year (or average rise in creatinine > 10%/year) in Stage 3
- Average fall in eGFR > 4 ml/min/1.73m² per year (or average rise in creatinine > 15%/year) in Stage 4

Indications for referral in the presence of eGFR > 60 ml/min/1.73m²

- Multisystem disease with evidence of kidney damage (including abnormal urinalysis)
- Accelerated hypertension with suspicion of kidney damage
- Proteinuria > TPCR 100 mg/mmol (*see page 1 for measurement of protein excretion*)
- Proteinuria > TPCR 45 mg/mmol with microscopic haematuria
- Recurrent episodes of acute pulmonary oedema in the presence of normal LV function
- New diagnosis of adult polycystic kidney disease

* Estimates of eGFR 60-90 ml/min/1.73m² in patients without pre-existing evidence of CKD should not be investigated further.

Algorithm for the management of chronic kidney disease stages 3-5



Further advice is available:

- Faxback advice form is available from www.epsom-sthelier.nhs.uk/guidelines/; a secure electronic system is planned
- CKD advice line (CKD-advice@epsom-sthelier.nhs.uk) – NON ENCRYPTED and potentially unsafe so do not use patient-identifiable information
- Urgent advice is always available from duty Renal SpR/Consultant via St Helier switchboard (0208 641 5565)