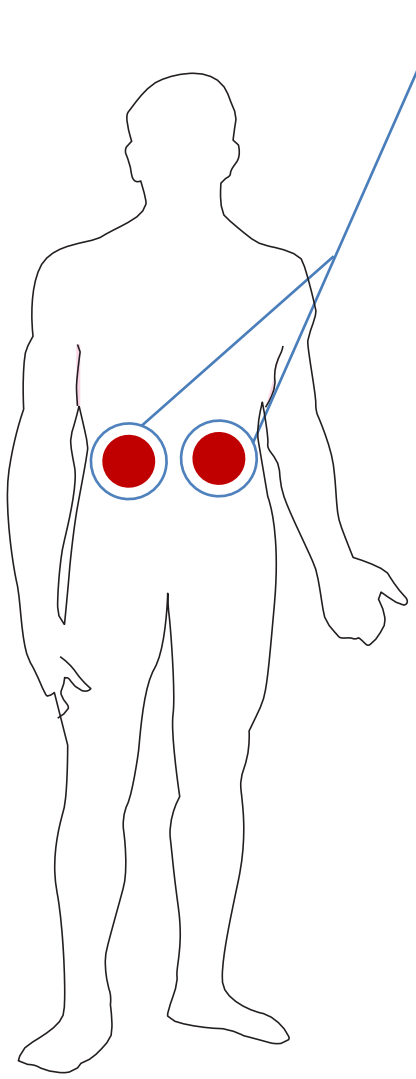
CHRONIC KIDNEY DISEASE – DIABETES

The North West London health and care partnership



All patients with Diabetes should be on a register and minimum data should include annual measures for microvascular disease. Please see Cardiovascular Risk for additional requirements.

DIABETIC NEPHROPATHY

Diabetic Nephropathy is characterised by the excretion of abnormal amounts of albumin in the urine, arterial hypertension or progressive decline in kidney function

ALBUMINURIA

Albuminuria is the earliest sign of kidney involvement in Type 2 Diabetes .

This is best assessed by laboratory measurement of the urinary albumin creatinine ratio (ACR).

Albuminuria is an independent risk factor for cardiovascular disease and progression to end-stage kidney disease.

All patients with albuminuria should be on maximal ACEi or ARB therapy (with appropriate reminder of good sick day guidance) and have BP controlled to target (see below)

People with type 2 diabetes and albuminuria should be preferentially treated with SGLT2 inhibitor according to the individual drug licences. (Please see SGLT2I safe prescribing guidance slide 37)

SEEK RENAL ADVICE IF

Unexplained sudden increases in albuminuria
Unexplained eGFR decline in absence of albuminuria

MANAGEMENT OF INDIVIDUAL WITH DIABETIC NEPHROPATHY

Patient education is an integral part of overall management

Lifestyle changes, weight loss and smoking cessation should be advised

Target HbA1c:

Type 1 Diabetes
- CKD stages 1 and 2 = 48 - 58 mmol/mol
- CKD stages 3 and 4 = 58 - 62 mmol/mol
- CKD stage 5 (incl on dialysis) = 58 – 68 mmol/mol

Type 2 Diabetes
- CKD stages 1 and 2 = 48 - 58 mmol/mol
- CKD stages 3 and 4 on non-hypo inducing agents = 52 - 58 mmol/mol
- CKD stages 3, 4 and 5 (incl on dialysis) on hypo inducing agents = 58 – 68 mmol/mol

Prescribe maximal tolerated dose of ACE Inhibitors or Angiotensin 2 receptor blockers

People with type 2 diabetes and albuminuria should be preferentially treated with SGLT2 inhibitor according to the individual drug licences. (Please see SGLT-2i safe prescribing guidance slide 37)

Maintain blood pressure below 140/90 (130/80 if ACR > 70)
- Calcium channel blocker drugs and low dose thiazide diuretics are useful second line agents
- Loop diuretics are useful in the presence of volume overload (e.g. leg oedema not caused by the side effects of calcium channel blockers)
- Additional antihypertensive therapy may be required.

Treat dyslipidaemia (serum cholesterol, LDL cholesterol and serum triglycerides to targets)

Aspirin therapy if eGFR <60 and ACR>70

Ensure patient understands sick day guidance for relevant drugs eg ACE/ARBs/ Metformin/SGLT2Is

CHRONIC KIDNEY DISEASE – DIAGNOSIS

WHO SHOULD BE TESTED FOR CKD

Offer testing for CKD using eGFR, serum creatinine and urinary ACR to people with any of the following risk factors:

- diabetes
- hypertension
- acute kidney injury
- cardiovascular disease (ischaemic heart disease, chronic heart failure, peripheral vascular disease or cerebral vascular disease)
- structural renal tract disease, recurrent renal calculi or prostatic hypertrophy
- multisystem disease e.g.systemic lupus erythematosus
- family history of end-stage kidney disease (GFR category G5) or hereditary kidney disease
- Haematuria

INTERPRETING eGFR VALUES

- Interpret eGFR values of > 60 ml/min/1.73 m2 with caution - estimates of GFR become less accurate as the true GFR increases
- eGFR is unreliable at extremes of body weight:
  - eGFR underestimates in people with high BMI
  - eGFR overestimated in people with low BMI
- **Confirm an eGFR result of less than 60 ml/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**

CLASSIFICATION OF CKD USING eGFR AND ACR CATEGORIES

GFR and ACR categories and risk of adverse outcomes			ACR categories (mg/mmol) description and range			Increasing risk
			<3 Normal to mildly increased	3-30 Moderately increased	>30 Severely increased	
			A1	A2	A3	
GFR categories, description and range	≥ 90 Normal and high	G1	No CKD in the absence of markers of kidney damage*			
	60-89 Mild reduction related to normal range for a young adult	G2				
	45-59 Mild-moderate reduction	G3a				
	30-44 Moderate-severe reduction	G3b				
	15-29 Severe reduction	G4				
	≤15 Kidney failure	G5				

Increasing risk

HAEMATURIA

- Use dipstick reagent strips rather than urine microscopy
- Evaluate further if there is a result of 1+ or more (rpt in 2 weeks)
- Dipstick haematuria not diagnostically useful with concurrent menstrual period, infection or in catheter samples

PROTEINURIA

- Proteinuria is a useful marker of kidney damage and complication risk
- ACR is the recommended method for assessing proteinuria
- If initial ACR = 3-70 confirm with a subsequent early morning sample
- If initial ACR > 70 mg/mmol, a repeat sample need not be tested
- Confirmed ACR ≥ 3 signifies clinically important proteinuria.

CHRONIC KIDNEY DISEASE – REFERRAL CRITERIA

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URGENT

- Suspected multisystem disease with evidence of renal involvement
- Suspected acute kidney injury
- Newly diagnosed eGFR < 15
- Nephrotic syndrome
- Accelerated hypertension
- Severe hyperkalaemia

NON-URGENT

- Stage 3 CKD where diagnosis uncertain
- Asymptomatic CKD G4 or G5 with or without Diabetes
- ACR > 70 mg/mmol, unless known to be caused by Diabetes and already appropriately treated
- ACR > 30 mg/mmol together with haematuria
- Sustained decrease in GFR of ≥ 25%, and a change in GFR category or sustained decrease in GFR of ≥ 15ml/min 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 (serum creatinine rises by >30% or eGFR falls by >25% after starting ACEI/ARB)

INVESTIGATING THE CAUSE OF CKD

Determining the risk of adverse outcomes

Agree a plan to establish the cause of CKD during an informed discussion with the person with CKD, particularly if the cause may be treatable (for example, urinary tract obstruction, nephrotoxic drugs or glomerular disease).

Use the person's GFR and ACR categories to indicate their risk of adverse outcomes (for example, CKD progression, acute kidney injury, all cause mortality and cardiovascular events) and discuss this with them.

INDICATIONS FOR RENAL ULTRASOUND

Offer a renal ultrasound scan to all people with CKD who:

- have accelerated progression of CKD
- have visible or persistent invisible haematuria
- have symptoms of urinary tract obstruction
- have a family history of polycystic kidney disease and are aged over 20 years
- have a GFR of less than 30 ml/min/1.73 m2 (GFR category G4 or G5)
- are considered by a nephrologist to require a renal biopsy.

Advise people with a family history of inherited kidney disease about the implications of an abnormal result before a renal ultrasound scan is arranged for them.

MINIMAL INFORMATION REQUIRED FOR REFERRAL OR ADVICE

- Dates and results of all previous creatinine/eGFR measurement
- Medical history
- Drug history
- Current BP
- Urine results: dipstick and a measure of urine proteinuria
- Renal Ultrasound result (unless exceptional reason delineated)
- HCO3 Bicarbonate <20 mol/l, bicarbonate supplementation slows the rate of decline of renal function in stage 4 CKD, and is routinely used in the renal diabetic clinic
- ***Refer if:***
- Sustained decrease in GFR of ≥ 25%, and a change in GFR category within 12 months
- Sustained decrease in GFR of ≥ 15ml/min within 12 months
- eGFR<20 Hb<10.5, K>6, Ca<2.1 Phosphate>1.5 (AD)

CHRONIC KIDNEY DISEASE – REFERRAL ALGORITHM

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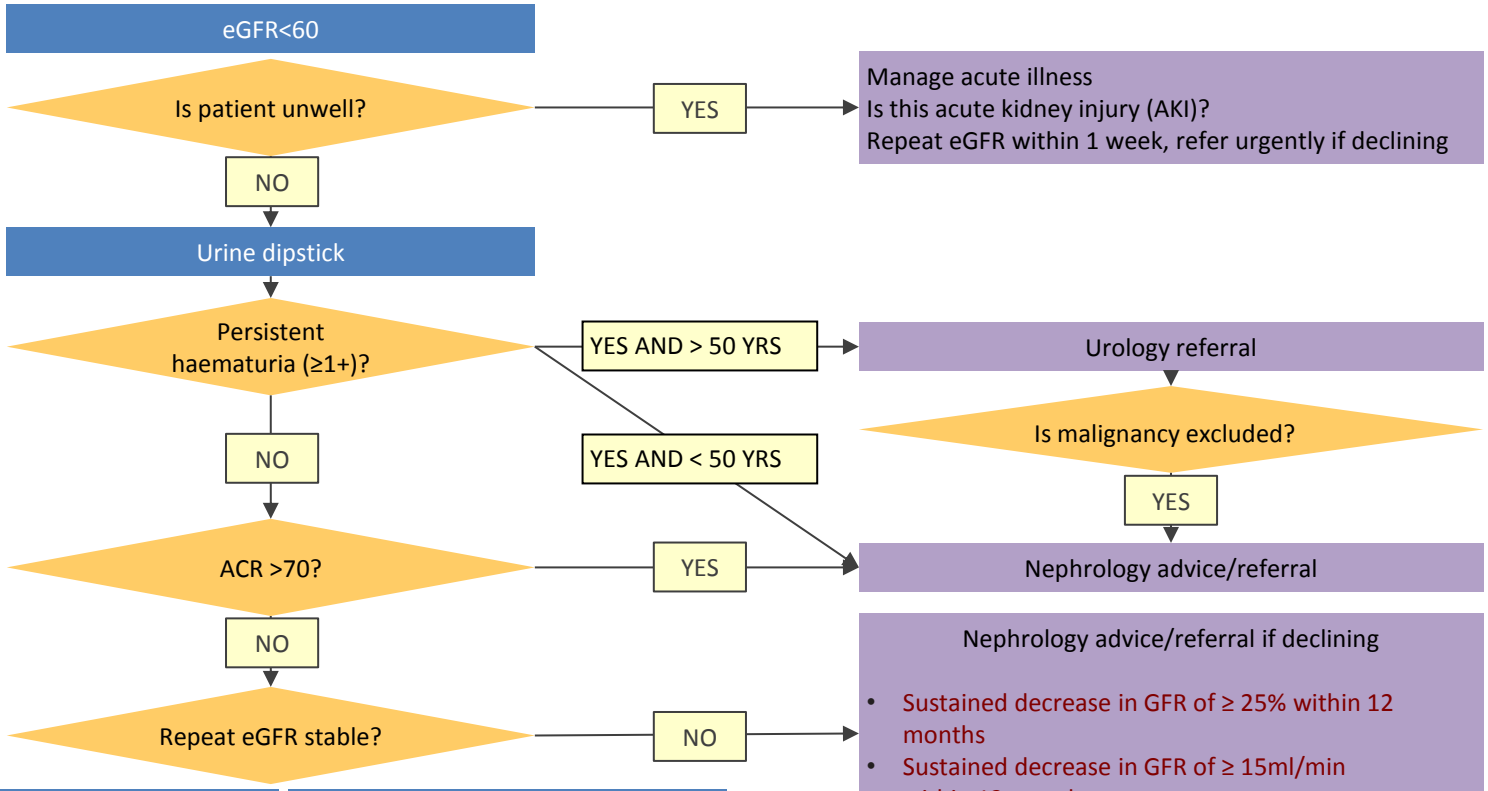

STAGE G3a and G3b	STAGE G4 - 5
Monitor according to page 51	Most people with CKD 4/5 should be being followed in secondary care HOWEVER – if RRT not indicated (e.g. frail elderly), management of advanced CKD may be appropriate in primary care

Email advice from nephrology consultants is available to North West London primary care services:

- ICHC-tr.ckdadvice@nhs.net

URGENT REFERRAL

- Suspected multisystem disease with evidence of renal involvement
- Acute kidney injury (without an obvious cause manageable in primary care)
- Newly diagnosed eGFR < 15
- Nephrotic syndrome
- Accelerated hypertension
- Severe hyperkalaemia (>6.5mmol/L)

Minimum information for referral

- Dates and results of previous creatinine/eGFR measurement
- Medical history
- Drug history
- Current BP
- Urine dipstick and ACR if dipstick positive

Renal Ultrasound if:

- accelerated progression of CKD
- visible or persistent invisible haematuria
- symptoms of urinary tract obstruction
- family history of polycystic kidney disease and are aged over 20 years
- eGFR of <30 ml/min/1.73 m2 (GFR category G4 or G5)

CHRONIC KIDNEY DISEASE – ONGOING MANAGEMENT

MANAGEMENT OF STABLE CKD

Agree management plan with patient

Lifestyle advice
Smoking cessation advice
Avoid NSAIDs (even topical)
Vaccinate for influenza and pneumococcus

BP:
- Encourage home BP monitoring
- Target BP: < 140/90 if ACR ≤ 70
  < 130/80 if ACR > 70
- Caution of BP targets in frailty (See page 7)
- Prioritise ACEi/ARB with associated sick day guidance

Cardiovascular risk:
- Aspirin – if CV risk at 10yrs >20%
- **Proton-pump inhibitors (PPIs)** – esp. if higher risk of gastric irritation with aspirin. Observational data suggest PPIs may cause insidious inflammatory kidney injury – switch to ranitidine if eGFR falling
- Statins – all patients with CKD3b and beyond should be on unless contra-indicated

Serum bicarbonate
- Consider sodium bicarbonate 500mg twice daily if acidotic (serum bicarbonate <22 mmol/L)

RENAL ANAEMIA

Renal anaemia can start to develop from CKD stage 3b (eGFR<45) and is common in advanced CKD5 (eGFR<15). This may require treatment with intravenous iron and erythropoietin.

Particularly in CKD stages 3b/4, renal anaemia should only be diagnosed after exclusion of other causes including iron deficiency, folate/B12 deficiency, haemolysis.

FREQUENCY OF MONITORING eGFR (NUMBER OF TIMES PER YEAR)

GFR and ACR categories and risk of adverse outcomes			ACR categories (mg/mmol) description and range		
			<3 Normal to mildly increased	3-30 Moderately increased	>30 Severely increased
			A1	A2	A3
GFR categories, description and range	≥ 90 Normal and high	G1	**≤1**	**1**	**≥1**
	60-89 Mild reduction related to normal range for a young adult	G2	**≤1**	**1**	**≥1**
	45-59 Mild-moderate reduction	G3a	**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

RENIN-ANGIOTENSIN SYSTEM INHIBITORS IN CKD (ACEI and ARB)

- ACEi and ARB prevent scarring in CKD and should be used preferentially in patients with proteinuria
- Assess kidney function and electrolytes. 1-2 weeks after initiating therapy and with any subsequent dose increase, watch out for hyperkalemia
- A small rise in creatinine or a mild fall in eGFR values is expected with therapy – repeat the assessment of kidney function if the rise in creatinine is greater than 15%
- STOP therapy - If serum creatinine rises by >30% or eGFR falls by >25%: seek specialist advice (to exclude possible renovascular disease)
- If K>6.0 stop ACEi/ARB and start low potassium diet – if the patient has proteinuria or heart failure with reduced ejection fraction and would benefit from an ACEi/ARB seek Nephrological advice as introduction of potassium binders, frusemide or bicarbonate can facilitate reintroduction of these agents
- Concomitant use of ACEi/ARB with spironolactone and other potassium sparing diuretics requires close monitoring of potassium

Management of CKD in the context of frailty requires a holistic approach

Kidney Ageing

Kidney function (GFR) declines with age:
- ~0.8 mL/min/year after 35 years old
- up to 2mL/min/year after 70 years old

- eGFR >30mL/min in the absence of acute illness, proteinuria or uncontrolled HTN is unlikely to progress to end-stage kidney disease

Focus of Care in Frail people

- Should be patient and outcome centred
- View CKD in the context of an individual's comorbidities and personal priorities
- Renal replacement therapy (RRT) may not improve quality of life – focus on symptom control may be more appropriate
- Advance care planning should be a priority

MANAGEMENT OF FRAIL PEOPLE WITH CKD

Identify frailty and screen for cognitive impairment
- Calculate EFI score (https://doi.org/10.1093/ageing/afw039)
- Screen cognition using GPCOG (http://gpcog.com.au/)

Medications
- Frail people are more susceptible to harm from medications
- Refer to "Drugs and CKD" page 53

Blood pressure (BP) or HbA1c targets - individualise to patient:
- Be wary of falls risk – check postural BPs
- Higher BP targets are appropriate e.g.. systolic BP 130-159 mmHg / diastolic BP 70-89 mmHg

- Be wary of hypoglycaemia risk with insulin and oral hypoglycaemic agents
- Higher HbA1c targets are appropriate e.g.. 58-68 mmol/mol

Diet – avoid protein restriction / aggressive salt restriction

Monitoring of renal function
- If renal replacement therapy (RRT) is considered - refer to page 54
- If RRT is unlikely to improve quality of life, tailor frequency to clinical need

In event of sudden eGFR decline exclude common causes:
- UTIs
- Dehydration
- Obstructive uropathy
- Medications (e.g.. Diuretics, anti-hypertensives, NSAIDs)

Consider nephrology advice if:
- Unexplained and sustained decline in renal function / new nephrotic range proteinuria
- Refractory and symptomatic anaemia (<100g/L) in advanced CKD (stages 3b – 5) may require intravenous iron +/- erythropoietin supplementation

Further advice

Specialty advice is available to North West London primary care services:
- ICHC-tr.ckdadvice@nhs.net (nephrology consultant advice)
- ICHC-tr.adviceelderlymedicine-imperial@nhs.net (consultant geriatrician advice)