Chronic Kidney Disease

Key Facts:
- Many people with CKD will never develop end stage renal disease; however they are all at increased risk of cardiovascular disease
- The main risk factors for CKD are age, hypertension, diabetes (poorly controlled), acute kidney injury; HIV and inflammatory conditions such as RA. Also NSAIDs and other medications
- It is normal to drop 1 eGFR point with each year of life

Diagnosis of CKD

- Only diagnosed if there are ***two low eGFR / high creatinine readings at least 3 months apart***
- Calculate eGFR from creatinine using a calculation tool (e.g. MDCalc using 2021 CKD-EPI equation)
- If first raised creatinine – see separate protocol 'raised creatinine'
- Assess rate of change in eGFR / creatinine to indicate the rate of progression of CKD – discuss with consultant if rapid progression of CKD
- In women of reproductive age, ensure not pregnant

Classification of CKD

CKD stage	eGFR	Monitoring
1	>90	Look for and manage any underlying conditions. Good control of diabetes and hypertension will protect kidneys - see relevant protocols. Stages 2 + 3a - avoid medication which could make worse (NSAIDs); annual creatinine if not already indicated as part of regular disease monitoring. If persistent proteinuria (no UTI) – manage as for stage 3b
2	60-89	
3a	45-59	
3b	30-44	Monitor 6 monthly is stable, 3 monthly if worsening
4	15-29	Monitor 3 monthly if stable, more often if deteriorating
5	<15	

Management of CKD stages 3b-5 (and 1-3a with proteinuria)

1. Investigations:
   - Urine dipstick to check for proteinuria – (alternative to ACR which is expensive)
     At diagnosis and then annual unless previously diagnosed with proteinuria *(once someone has proteinuria due to CKD, it is unlikely to resolve so no need to retest unless UTI symptoms)*
     Further urinalysis if ?UTI (symptoms, may be other features on dipstick)
     Treat proteinuria with ARB or ACEI
   - USS at diagnosis (for baseline, kidney size, reversible causes)
   - Creatinine at diagnosis then after 6 months. If stable can do annually. Watch for progression.
   - Hb at diagnosis then annually and work up for anemia if low (note that anemia not due to CKD unless eGFR<30)
   - If not known diabetic - HbA1C at diagnosis (if not within 12m)
   - Check HIV status and advise testing if unknown
   - Na/K? Not required routinely – check if clinical concern or depending on medication
2. Patient education:
   - Need for follow up - CKD is asymptomatic but progressive, need good chronic disease management
   - Diet and lifestyle – drink plenty, healthy weight, no smoking, low salt diet, physical exercise, avoid NSAIDs and herbal medications, avoid dehydration (!!if Muslim need to discuss Ramadan – increases risk of AKI, worsening of CKD and may increase the risk of CVD, may need medical exemption)
   - Vaccinations - recommend flu (annual), Covid, HBV and pneumococcal (5 yearly)
   - Women of reproductive age ?family planning
3. Check fluid status and weight (fluid overload?), pulse rate (AFib?), BP

4. Prescribing (cardiovascular risk reduction is key):
   - **Optimize management of any underlying conditions** (see specific protocols)
   - **BP control (aim <140/90; if proteinuria aim <130/80);** use ACEI/ARB 1st line (see next page)
   - If **proteinuria** – ACEI/ARB to maximum tolerated dose (even if not hypertensive)
   - Offer **atorvastatin** 20mg od if can afford long-term, BUT BP/diabetes control more important
   - Consider **gliflozin** (e.g. empagliflozin 10mg OD) in all patients with CKD **<u>if</u>** patient can afford to take long-term. Greatest benefit with diabetes and/or proteinuria.
   - Aspirin 75mg od if Hx CVD
   - **Check all medication** - stop/adjust doses of drugs according to eGFR (see box and refer to information for specific drugs)

Management of CKD 4 + 5 (discuss with consultant at every review)

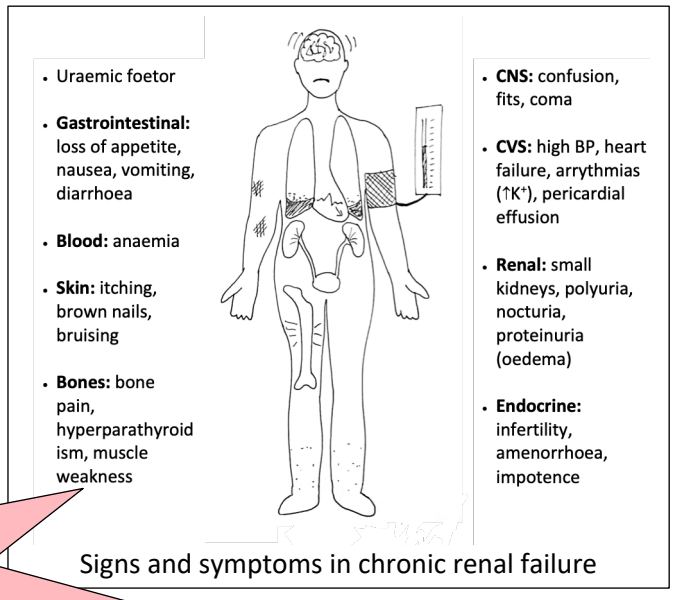
As above **AND:**

No need for routine checking of urea, PTH, ALP or uric acid!

5. Refer to nutritionist (low salt, low phosphate, low potassium, low protein)
6. Investigations:
   - **Creatinine** – rate of change will indicate prognosis, check every 3 months (or more often if deteriorating)
   - **Na/K?** – at least yearly, or depending on clinical indications and medication
   - **CBC** – if signs of **iron deficiency anemia** – check for blood loss / underlying cause other than CKD - treat with ferrous sulphate alternate days for 3 months (take on empty stomach) then recheck, aiming for Hb 10-12g/dL; discuss with consultant if not increasing to consider diagnosis, further investigations and ?IV iron
   - **Phosphate and calcium** – if normal check six monthly; if high phosphate or low calcium – treat with Calcium/vit D, one tablet with each meal (for phosphate binding) and recheck after 3 months, ensure low phosphate diet.
     If no improvement to phosphate or calcium levels with Ca/Vit D supplements, start higher dose Vitamin D3 (e.g. 60,000IU per week); recheck phosphate and calcium again after 2-3 months.

Consultant review:
All CKD 4/5 patients
If rapid progression of CKD
If considering referral for dialysis
Persistent Hematuria
Electrolyte abnormalities
Severe anemia, or anemia not improving with iron

7. Advise 1 teaspoon of bicarbonate in a glass of water twice daily (to prevent metabolic acidosis)
8. **Symptom control** (often asymptomatic early on; increasing symptoms as disease worsens – see figure):
   - If fluid overloaded, then use loop diuretic rather than thiazide (may need high doses)
   - Itching (can try cetirizine 10mg od), topical emollient
   - Recurrent gout – allopurinol 100mg od
   - Nausea (antiemetics), hiccups (promethazine, chlorpromazine)
9. **Discussion about future management, possible referral/dialysis** (see separate guideline – *consider* especially if: younger patients (<50y) with progressive CKD (25% change in creatinine/eGFR over 3 months) or renal failure of unknown cause.



Signs and symptoms in chronic renal failure

If dialysis is not appropriate, continue **Comprehensive Conservative Management of CKD** as above

- CKD is not curable but there is much that can be done
- Actively manage CKD and any co-morbidities
- Symptom control
- Consider palliative care referral – especially if progression of disease / deterioration in condition

Prescribing in CKD

Commonly used drugs that CAUSE renal failure	Drugs that can BUILD UP in renal failure
Antihypertensives: **ACEI/ARB** – important for protecting the kidneys but can cause deterioration in renal function • check creatinine 1-2 weeks after starting and 1-2 weeks after any dose increase: - if creatinine rises 15-30%, continue ACEI/ARB and repeat creatinine in 1-2 weeks - if creatinine rises >30%, stop ACEI/ARB, return to previous dose and recheck in 5-7 days • do not give in pregnancy • when ACEI/ARB used in CKD stage 5, watch K^+ and creatinine closely **Diuretics** – check creatinine 1-2 weeks after starting or after any dose increase, use loop diuretics if fluid overload, thiazides ineffective in CKD4/5, avoid spironolactone as risk hyperkalemia, hydralazine – reduce dose if CKD 4/5 (Beta-blockers and CCI are safe in CKD)	**Metformin:** reduce dose if CKD 3b (eGFR 30-45); stop if CKD 4/5 (eGFR<30) **Opioids**: use lower doses and may only need to give once every 24 hours Digoxin Lithium
Other medications: NSAIDs and aspirin (paracetamol is safe) PPIs and H2RA Antibiotics including aminoglycosides, cotrimoxazole (septrin) and cephalosporins Protease inhibitors (lopinavir/ritonavir - Kaletra) Lithium Some chemotherapy Dyes/contrast used in radiology imaging **Check all drugs you prescribe for renal dosing!!**	**Other considerations** **Calcium/vit D** – a common supplement in CKD 4/5 – to take with meals but ensure that other medication is taken *at different times* (as calcium/vit D will reduce absorption)

References:
Consultation with Dr Joe Watlington, visiting nephrologist February 2022; EMPA-KIDNEY trial - NEJM 2022;388:117 Kidney International Supplements (2013) 3: 4-14; KDIGO; Practical Guide to Common Medical Problems, Malte von Blumröder, IAM, 2005; NCD Clinical Guide 2021 Primary Care International *(adapted for this context and location. PCI have not been involved in, nor hold responsibility for any adaptations. Original can be found by contacting PCI:* https://pci-360.com)