

Department of Internal Medicine, Harry Gwala Regional Hospital

Guideline: PREVENTION AND MANAGEMENT OF CHRONIC KIDNEY DISEASE IN ADULTS

1. Case for preventing chronic kidney disease

Chronic kidney disease (CKD) occurs frequently in adult patients in the Harry Gwala Regional Hospital catchment area. CKD may progress to end-stage kidney disease, which is fatal without renal replacement therapy (RRT). Access to RRT is limited due to severe resource constraints in the public sector. Prevention is therefore an essential strategy to reduce morbidity and mortality due to CKD.

2. Identification of adults at risk of chronic kidney disease

Risk factors for CKD and key identifying features are summarized below:

<i>Risk factor</i>	<i>Clinical identifiers</i>
Hypertension	BP >140/90 on three or more occasions
Diabetes	Random glucose >11.1 <u>or</u> fasting glucose >7.0 mmol/l on two occasions <u>or</u> HbA1c >6.5%
Living with HIV	HIV antibody positive, detectable viral load, low CD4 count
Obesity	BMI >30 kg/m ²
Anatomical abnormalities of the urinary tract	Recurrent urinary tract infections <u>or</u> poor urine flow (men)
Primary renal disease	Haematuria and/or proteinuria on dipstick Prior episode of acute kidney injury

3. Screening for kidney disease in patients with risk factors

Patients and clinicians need to be aware of incipient or established CKD before appropriate interventions can be started (i.e., 'diagnosis before treatment'). Importantly, more than 50% of renal function must be lost before the creatinine level becomes abnormal.

The following strategies are useful to assess for CKD:

Urine protein to creatinine ratio (uPCR). This test is measured on a single random urine specimen when there are no symptoms to suggest a urinary tract infection (dysuria, fever/chills, leucocytes and/or nitrates on dipstick). An abnormal test should be repeated a month later. Multiplying the value by 10 gives an estimation of the 24-hour urine protein excretion.

Glomerular filtration rate (eGFR). This test should be performed when the patient is feeling well and not during a period of acute illness, when the patient may not be in renal steady state. Note that the patient's gender and age is needed to calculate the value. A value of <60 ml/min/1.73m² is abnormal. Note that the value may be misleadingly high in severely wasted patients with CKD, and misleadingly low in patients with normal renal function and a high muscle mass.

4. Monitoring patients with chronic kidney disease

- eGFR >45: Yearly eGFR and uPCR
- eGFR 15-44: Twice yearly eGFR, haemoglobin
- eGFR <15: Three monthly eGFR, electrolytes, haemoglobin

5. Management of chronic kidney disease

Management of CKD primarily focuses on modifying disease processes that are harmful to kidneys, specifically by:

- Treating blood pressure to <130/80 mmHg
- Treating diabetes to an HBA1c of <7%
- Treating HIV infection to an undetectable viral load
- Stopping nephrotoxic drugs e.g., NSAIDs
- Treating intercurrent urinary tract infections
- Correcting anatomical abnormalities (e.g., renal stones, ureteric reflux, prostatic enlargement)
- Counselling on weight reduction (this is often ineffective, and ideally obesity should be treated with bariatric surgery which is currently not available in the public sector)

Management of chronic diseases should be accordance with current Department of Health guidelines.

ACE inhibitors (ACEI) or angiotensin receptor blockers (ARBs), at the highest tolerated dose, have been shown to reduce proteinuria and slow the progression of kidney disease, and should always be considered for patients with CKD and hypertension, diabetes, HIV and/or primary glomerular disease. Note that a low eGFR in a stable patient is not a contraindication to ACEI/ARB therapy. Serum potassium should be checked a week after starting ACEI or ARB therapy or increasing the dose.

Hyperphosphatemia should be treated with an oral phosphate binder taken with meals – usually calcium carbonate 500-1000 mg (elemental calcium) three times daily

Bicarbonate replacement can be used for patients with metabolic acidosis ($\text{HCO}_3^- < 18 \text{ mmol/L}$). Acidosis usually occurs when the GFR is <30 ml/min, but can occur at higher GRFs with tubule-interstitial disease. Replacement is initially with oral sodium bicarbonate 650 mg twice daily (15.5 mEq / d), which is approximately equal to a quarter of a teaspoon of bicarbonate of soda (baking soda) twice daily. Maintenance therapy should be titrated to serum bicarbonate over a period of months to achieve normal levels. Sodium load from bicarbonate therapy can cause hypertension and oedema that may require diuretic therapy. Shohl's solution is sodium citrate with citric acid and may reduce the sodium load in patients with refractory oedema. Note that the EDL does not specifically recommend bicarbonate replacement and benefit has not been demonstrated in a recent Cochrane review.

Note that both dehydration (usually from gastroenteritis or uncontrolled diabetes) and fluid overload (usually from heart failure) compromise renal function and should be promptly treated with either fluids or diuretics and fluid restriction. Patients should be advised to measure their weight at home each week. Sudden changes in weight are usually due to changes in fluid status.

Other risk factors should also be managed: prescribe a statin for secondary prevention (type 2 diabetes mellitus, stroke, myocardial infarction), advise the patient to stop smoking, and to stop using alcohol and recreational drugs.

6. Adherence support

Living with chronic disease can feel overwhelming for patients and family. The following strategies are helpful to support treatment adherence:

- Give advice in simple, layman terms
- Ask the patient to learn the names and doses of medications (or to keep written down in a safe place)
- Ask the patient to bring all medications to every visit
- Prescribe medications as a daily dose if possible

- Advise to take medications at the same time every day (use a cell phone reminder)
- Ask the patient to come in with a trusted family member who is willing to learn about CKD and support the patient's adherence to therapy
- Screen for depression and treat with counselling and medication
- Make sure your clinic is a welcoming and emotionally safe environment

7. Indications for referral to MOPD

Patients should be referred for Internal Medicine review if:

- eGFR <30 on at least two occasions with hypertension / diabetes / HIV (for evaluation for RRT)
- eGFR <60 on at least two occasions without hypertension / diabetes / HIV (for a diagnosis and management plan)
- Persisting proteinuria without hypertension / diabetes / HIV (for a diagnosis and management plan)
- Persisting haematuria (for a diagnosis and management plan)
- Suspected urinary tract abnormality with eGFR <60 (for a diagnosis and management plan) (if eGFR is >60 please refer to Urology)

8. Recommended resources

Primary Healthcare (PHC) Standard Treatment Guidelines and Essential Medicines List for South Africa - 2020. <https://www.knowledgehub.org.za/elibrary/primary-healthcare-phc-standard-treatment-guidelines-and-essential-medicines-list-south>

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