QUICK REFERENCE FOR HEALTHCARE PROVIDERS

MANAGEMENT OF
CHRONIC KIDNEY DISEASE
(SECOND EDITION)

Ministry of Health Malaysia

Malaysian Society of Nephrology

Academy of Medicine Malaysia

KEY MESSAGES

1. Targeted screening in high risk groups is necessary to detect chronic kidney disease (CKD) & early intervention is important to delay its progression. CKD management requires shared decision making & close collaboration between different levels of healthcare.
2. Screening for CKD includes assessment for proteinuria, haematuria & renal function [using estimated glomerular filtration rate (eGFR) based on CKD-epidemiology (CKD-EPI) creatinine equation].
3. Detection of CKD should be followed by staging using eGFR, risk stratification with albuminuria & determination of underlying cause. This is based on Kidney Disease Improving Global Outcomes (KDIGO) classification.
4. Target blood pressure (BP) & glycaemic control should be individualised according to co-morbidities & age.
5. Angiotensin converting enzyme inhibitor (ACEi) or angiotensin receptor blocker (ARB) should be used as first-line antihypertensive agent in diabetic kidney disease (DKD) with albuminuria & non-DKD with proteinuria ≥0.5 g/day.
6. Dual renin-angiotensin system blockade should only be used in carefully selected non-DKD patients with proteinuria under close supervision by nephrologists.
7. All cardiovascular (CV) risk factors should be addressed in patients with CKD to reduce CV events. Aspirin should only be used for secondary prevention of CV disease (CVD).
8. All female patients of reproductive age with CKD should receive pre-pregnancy care.
9. The optimal time of nephrology referral depends on the indications while the urgency is based on the trend of eGFR.
10. Screening for CKD-related complications is recommended at CKD stage 3 onwards.

This Quick Reference provides key messages & a summary of the main recommendations in the Clinical Practice Guidelines (CPG) Management of Chronic Kidney in Adults (Second Edition).

Details of the evidence supporting these recommendations can be found in the above CPG, available on the following websites:

Ministry of Health Malaysia : www.moh.gov.my
Academy of Medicine Malaysia : www.acadmed.org.my
Malaysian Society of Nephrology : www.msn.org.my

CLINICAL PRACTICE GUIDELINES SECRETARIAT
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SCREENING

- Patients with diabetes mellitus and/or hypertension should be screened at least yearly for CKD.
- Screening for CKD may be considered for patients with:
  - age >65 years old
  - obesity
  - CVD
  - metabolic syndrome
  - drugs e.g. nephrotoxic drugs, long-term use of proton-pump inhibitors or analgesics
  - family history of CKD or hereditary kidney disease
  - gout
  - multisystem diseases with potential kidney involvement e.g. systemic lupus erythematosus
  - structural renal tract disease, renal calculi or prostatic hypertrophy
  - opportunistic (incidental) detection of haematuria or proteinuria

KDIGO CLASSIFICATION

				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30 - 300 mg/g 3 - 30 mg/mmol	>300 mg/g >30 mg/mmol
GFR categories (ml/min/ 1.73 m^2) Description and range	G1	Normal or high	≥90			
	G2	Mildly decreased	60 - 89			
	G3a	Mildly to moderately decreased	45 - 59			
	G3b	Moderately to severely decreased	30 - 44			
	G4	severely decreased	15 - 29			
	G5	Renal failure	<15			

Green - low risk, Yellow - moderate risk, Orange - high risk, Red & Deep Red - very high risk

STRATEGIES IN DELAYING CKD PROGESSION

1. Established strategies:
   a. Optimal BP control
   b. Optimal blood glucose control
   c. Proteinuria reduction
   d. Renin-angiotensin system blockers
2. Strategies requiring more evidence:
   a. Lifestyle modifications (smoking cessation, weight reduction, low salt diet & dietary protein restriction)
   b. Sodium-glucose co-transporter-2 (SGLT2) inhibitors
   c. Uric acid reduction

TARGETS OF CKD TREATMENT

- BP target for CKD should be aimed at:

Cause \ Proteinuria	≥1 g/day	<1 g/day
DKD	≤130/80 mmHg (SBP 120 to 130 mmHg)	≤130/80 mmHg (SBP 120 to 130 mmHg)
Non-DKD	≤130/80 mmHg (SBP 120 to 130 mmHg)	≤140/90 mmHg* (SBP 120 to 140 mmHg)

SBP=systolic blood pressure

*BP targets should be individualised according to co-morbidities & age.

*Based on SPRINT (Systolic Blood Pressure Intervention Trial) study (median follow-up of 3.3 years), lowering SBP towards 120 mmHg can be considered in non-DKD patients with high CV risk, in whom BP lowering is well-tolerated.

- The target HbA1c should be ≤7% in DKD but this should be individualised according to co-morbidities & age.

PREGNANCY IN CKD

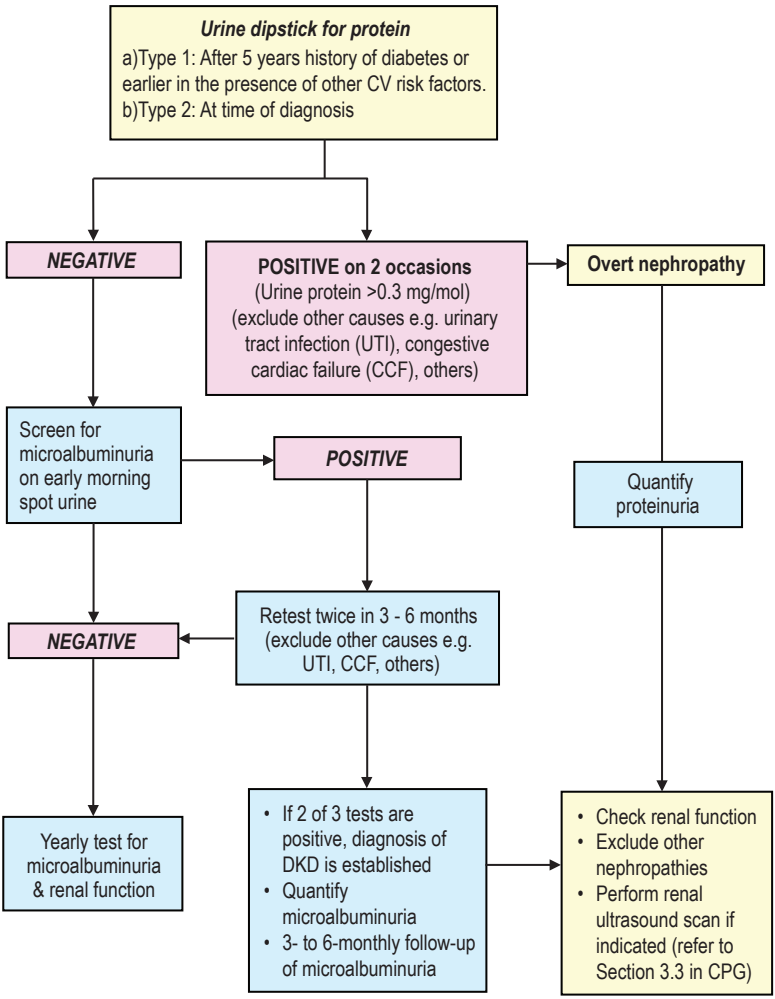
- Pregnancy may be considered in women with mild renal impairment (serum creatinine <124 μmol/L), well controlled BP & without significant proteinuria (<1 g/day).
- Pregnancy should be avoided in women with either:
  - moderate to severe renal impairment
  - poorly controlled hypertension
  - heavy proteinuria
  - active systemic disease
- All pregnant women with CKD should be co-managed by a multidisciplinary team.

REFERRAL

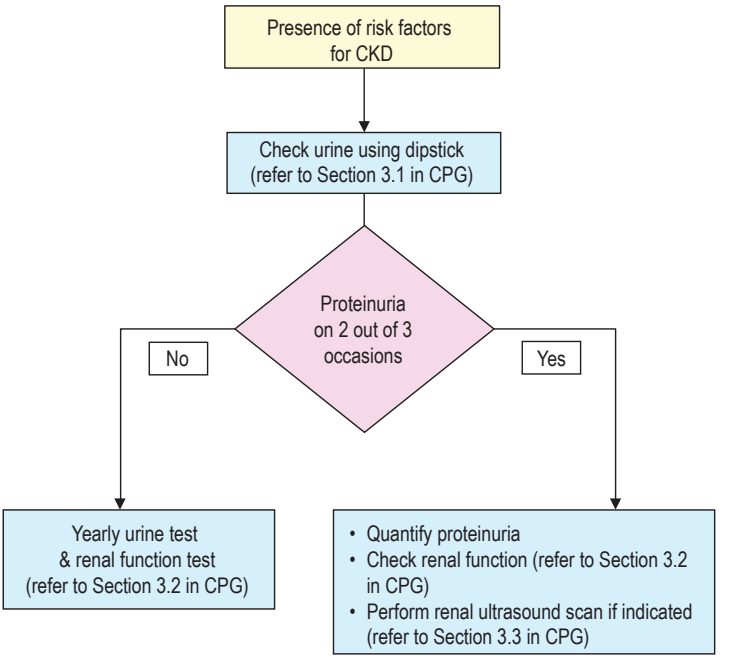
- A patient with CKD with any of the following criteria should be referred to a nephrologist/physician:
  - persistent heavy proteinuria [urine protein ≥1 g/day or urine protein: creatinine ratio (uPCR) ≥100 mg/mmol*] despite optimal treatment
  - persistent isolated microscopic haematuria after excluding urogynaecological cause
  - persistent haematuria with proteinuria (urine protein ≥0.5 g/day or uPCR ≥50 mg/mmol*)
  - rapidly declining renal function [loss of eGFR >5 ml/min/1.73 m^2 in 1 year or >10 ml/min/1.73 m^2 within 5 years]
  - eGFR <30 ml/min/1.73 m^2 (eGFR categories G4 - G5)
  - resistant hypertension (failure to achieve target BP despite 3 antihypertensive agents including a diuretic)
  - suspected renal artery stenosis
  - suspected hereditary kidney disease
  - pregnant or when pregnancy is planned
  - persistent abnormalities of serum potassium
  - unexplained cause of CKD

*This is an estimation for practical purpose. The actual conversion of urine protein 1 g/day=uPCR 113 mg/mmol.

ALGORITHM 1. SCREENING & INVESTIGATIONS FOR CKD IN ADULTS WITH DIABETES



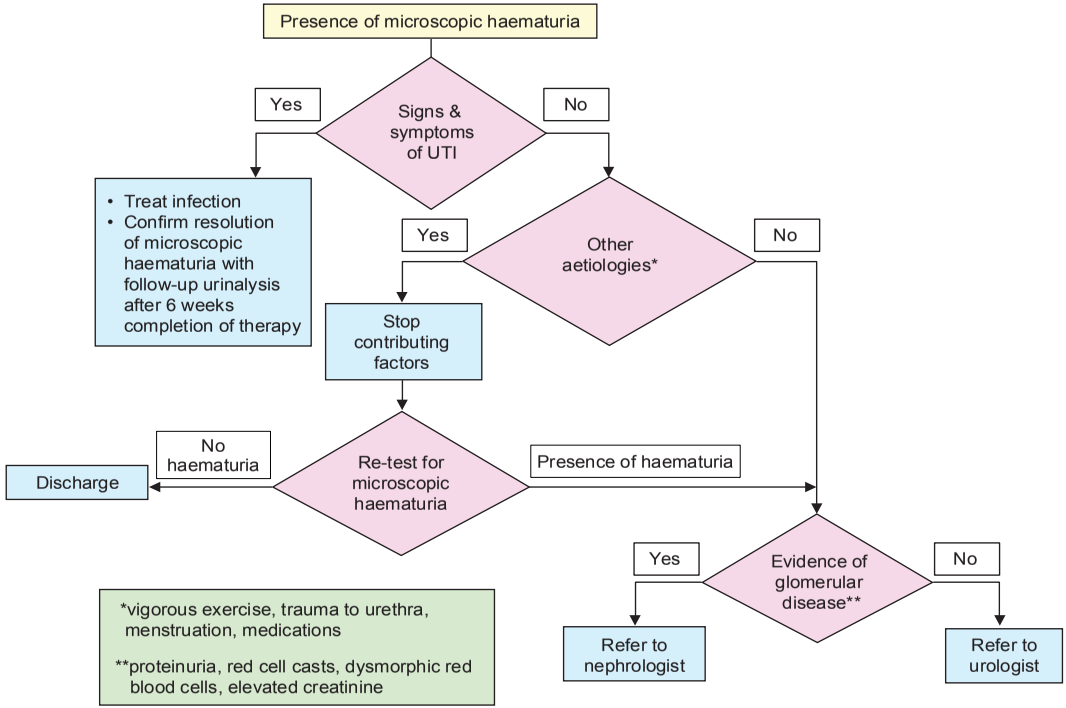
ALGORITHM 2. SCREENING & INVESTIGATIONS FOR CKD IN ADULTS WITHOUT DIABETES



DIAGNOSIS OF ABNORMAL PROTEIN OR ALBUMIN EXCRETION

Class	Urine dipstick reading	Urine ACR in mg/mmol	Urine total protein excretion in g/24 hour	Urine ACR in mg/mmol	Urine albumin excretion in µg/min (mg/24 hour)
Normal	Negative	<15	<0.15	<2.5 (male) <3.5 (female)	<20 (<30)
Microalbuminuria	Negative	<15	<0.15	≥2.5 to 30 (male) ≥3.5 to 30 (female)	20 - 200 (30 - 300)
	Trace	15 - 44	0.15 - 0.44		
Macroalbuminuria	1+	45 - 149	0.45 - 1.49	>30	>200 (>300)
	2+	150 - 449	1.50 - 4.49		
	3+	≥450	≥4.50		

ALGORITHM 3. EVALUATION OF HAEMATURIA IN CKD IN ADULTS



ALGORITHM 4. TREATMENT FOR CKD IN ADULTS