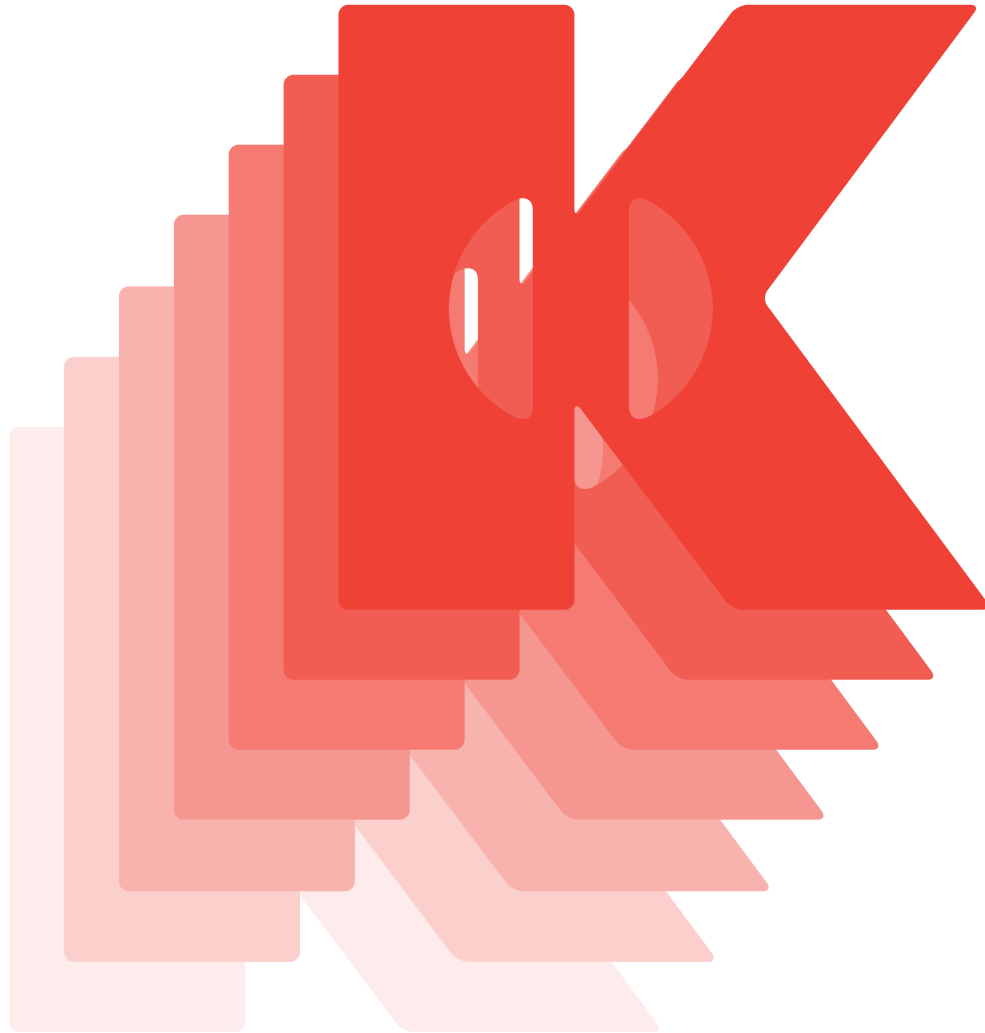


# CHRONIC KIDNEY DISEASE (CKD) MANAGEMENT IN GENERAL PRACTICE



## Early detection of CKD using kidney health check

Who is at higher risk of kidney disease?	What should be done?	How often?
Age > 50 years Diabetes High blood pressure Smoking Obesity Family history of kidney disease Aboriginal or Torres Strait Islander	blood pressure urine dipstick (microalbuminuria if diabetes present) eGFR	Every 12 months

Source: Adapted from Guidelines for preventive activities in general practice (The Red Book) 6th edition, 2005. The Royal Australian College of General Practitioners, South Melbourne, Victoria, Australia.

## DEFINITIONS OF ALBUMINURIA AND PROTEINURIA

	Micro-albuminuria	Macro-albuminuria	Proteinuria
<b>Albumin/creatinine ratio</b>	Females: 3.6–35 mg/mmol Males: 2.6–25 mg/mmol	Females: > 35 mg/mmol Males: > 25 mg/mmol	–
<b>Dipstick</b>	>3 mg/dL (albumin specific dipstick)	> 20 mg/dL (albumin specific dipstick)	Dipstick = 1+ or more
<b>Protein/creatinine ratio</b>	–	–	> 30 mg/mmol
<b>24 hour protein</b>	–	–	> 0.3 g/24 hrs

## eGFR clinical action plan

\* imaging or biopsy abnormalities, or proteinuria/haematuria  
 \*\* hypertension, diabetes, smoker, age > 50 yrs, obesity, family history of kidney disease, Aboriginal and Torres Strait Islander people

eGFR mL/min/1.73m <sup>2</sup>	Description	Clinical Action Plan
90	Stage 1 CKD – kidney damage* with normal kidney function	Further investigation for CKD may be indicated in those at increased risk**: – blood pressure – assessment of proteinuria – urinalysis
60–89	Stage 2 CKD – kidney damage* with mild ↓ kidney function	Cardiovascular risk reduction: – blood pressure – lipids – blood glucose – lifestyle modification (smoking, weight, physical activity, nutrition, alcohol)
30–59	Stage 3 CKD – moderate kidney function	As above, + : – monitor eGFR three monthly – avoid nephrotoxic drugs – prescribe antiproteinuric drugs (ACE inhibitors and/or ARBs) if appropriate – address common complications – ensure drug dosages appropriate for level of kidney function  Consider indications for referral to a nephrologist
15–29	Stage 4 CKD – severe kidney function	As above + referral to nephrologist is usually indicated for physical and psychosocial preparation for renal replacement therapy (dialysis, pre-emptive transplantation, transplantation) or conservative medical management
< 15	Stage 5 CKD – end-stage kidney disease	As above + referral to a nephrologist

## Indications for referral to a Nephrologist

Appropriate referral is associated with:

- reduced rates of progression to end stage kidney disease
- decreased need for and duration of hospitalisation
- increased likelihood of permanent dialysis access created prior to dialysis onset
- reduced initial costs of care following the commencement of dialysis
- increased likelihood of kidney transplantation
- decreased patient morbidity and mortality

### WHO MAY BE CONSIDERED FOR REFERRAL TO A NEPHROLOGIST?

Anyone with:

- eGFR < 30mL/min/1.73m<sup>2</sup>
- Unexplained decline in kidney function (> 15% drop in eGFR over three months)
- Proteinuria > 1g/24hrs (see clinical tip)
- Glomerular haematuria (particularly if proteinuria present)
- CKD and hypertension that is hard to get to target
- Diabetes with eGFR < 60mL/min/1.73m<sup>2</sup>
- Unexplained anaemia (Hb < 100 g/L) with eGFR < 60mL/min/1.73m<sup>2</sup>

Anyone with an acute presentation and signs of acute nephritis should be regarded as a medical emergency and referred without delay.

### Clinical tip

**Urine protein:creatinine ratio of 100 mg/mmol ≈ daily protein excretion of 1g/24hrs.**

## WHO DOES NOT USUALLY NEED TO BE REFERRED TO A NEPHROLOGIST?

### CKD Stage 2 and 3

- Stable eGFR 30–89 mL/min/1.73m<sup>2</sup>
- Minor proteinuria (<0.5 g/24hrs with no haematuria)
- Controlled blood pressure

The decision to refer or not must always be individualised, and particularly in younger patients the indications for referral may be less stringent (e.g. minor proteinuria).

### In CKD Stages 2 and 3

- Don't refer to nephrologist if targets of therapy are achieved
- Pay attention to CVD risk reduction
- Use ACE inhibitors/ARBs
- Monitor three to six monthly

### Clinical tip

**When referring to a nephrologist, ensure patient has had a recent kidney ultrasound, current blood chemistry, and quantification of proteinuria.**

## CKD management according to stage

CKD Stage	1	2	3	4	5
<b>Description</b>	Kidney damage + normal or ↑ eGFR	Kidney damage + mild ↓ eGFR	Moderate ↓ eGFR	Severe ↓ eGFR	End stage kidney disease
<b>eGFR (mL/min/1.73m<sup>2</sup>)</b>	≥ 90	60–89	30–59	15–29	< 15 or on dialysis
<b>Common Signs and Symptoms</b>	Nil		Nil or nocturia, mild malaise, anorexia	As for stage 3 + nausea, pruritis, restless legs, dyspnoea	As for stage 4
<b>Common Complications</b>	Hypertension		As for stage 1–2 + Mineral and Bone Disorder Anaemia Sleep Apnoea Restless legs CVD Malnutrition Depression	As for stage 3 + Hyperphosphataemia Acidosis Hyperkalaemia	As for stage 4 + Pericarditis GIT bleeding Encephalopathy Neuropathy
<b>Clinic Assessment</b>	BP Weight Urine dipstick		As for stage 1–2	As for stage 1–2 + Oedema	As for stage 4
<b>Lab Assessment</b>	General chemistry, eGFR Glucose Lipids		As for stage 1–2 + FBC Iron stores Ca/PO <sub>4</sub> PTH (quarterly)	As for stage 3	As per monthly blood schedule specified by Renal Unit
<b>Management</b>	Diagnosis Cardiac and kidney risk factor modification Treat BP to target < 130/80 mmHg or < 125/75 mmHg if proteinuria > 1g/24hrs (urine protein: creatinine ratio of 100 mg/mmol ≈ daily protein excretion of 1g/24hrs)		As for stage 1–2 + Treat complications Medication review	As for stage 3 + Dialysis education Dialysis access surgery	As for stage 4 + Dialysis or transplantation (or conservative medical management)
<b>Frequency of clinical review</b>	4–6 monthly		1–3 monthly	Monthly	Monthly (shared with renal unit)
<b>Nephrologist Referral</b>	Consider referral if indication is present		Consider referral if indication is present	All patients should be referred to a nephrologist	All patients should be referred to a nephrologist

## Principles of management of hypertension in people with CKD

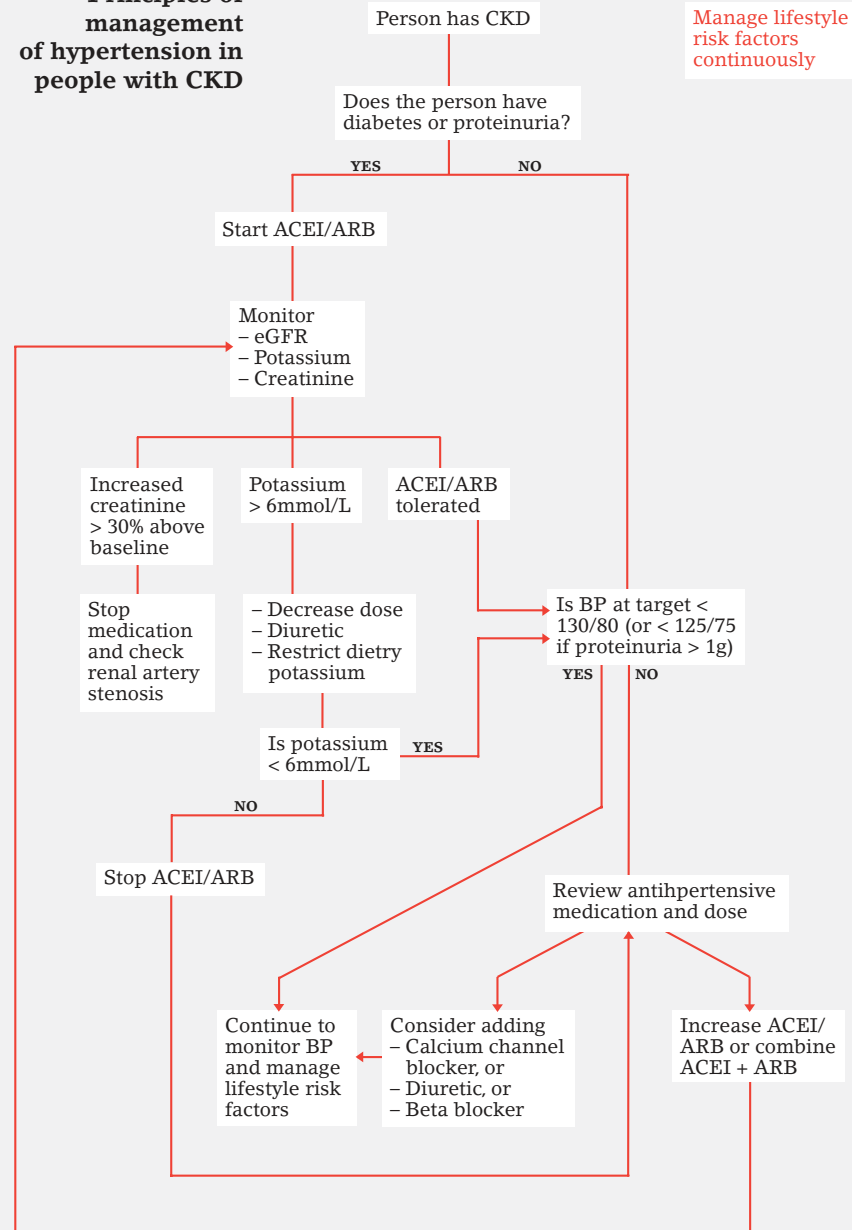


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## Treatment targets for people with CKD<sup>17</sup>

### Golden Rules

- Blood pressure targets in CKD are < 130/80 mmHg or < 125/75 if proteinuria > 1 g/24hrs
- Urine protein:creatinine ratio of 100 mg/mmol ≈ daily protein excretion of 1g/24hrs
- Achieving adequate BP targets will often require the use of more than one agent
- As eGFR declines more drugs will typically be required to achieve target blood pressure

Parameter	Target	Treatment & effects on systolic BP
<b>Lifestyle Factors</b>		
<b>Smoking</b>	Cease smoking	Lifestyle modification – refer to SNAP guide <sup>26</sup>
<b>Weight</b>	BMI ≤ 25 kg/m <sup>2</sup> WC males ≤ 94 cm <sup>27</sup> (≤ 90 cm in Asian populations) <sup>28</sup> WC females ≤ 80 cm <sup>27</sup>	Lifestyle modification – refer to SNAP guide SBP reduction = 5–20 mmHg/10 kg loss
<b>Physical activity</b>	> 30 mins physical activity/day	Lifestyle modification – refer to SNAP guide SBP reduction = 4–9 mmHg
<b>Nutrition</b>	Dietary salt intake 40–100 mmol/day <sup>29</sup>	Lifestyle modification – refer to SNAP guide SBP reduction = 2–8 mmHg
<b>Alcohol</b>	Moderate alcohol consumption only (1–2 standard drinks/day)	Lifestyle modification – refer to SNAP guide SBP reduction = 2–4 mmHg
<b>Clinical Factors</b>		
<b>Blood pressure</b>	< 130/80 mmHg < 125/75 mmHg if proteinuria > 1g/24hrs	Lifestyle modification ACE inhibitor and/or ARB first-line
<b>Proteinuria</b>	> 50% reduction of baseline value	ACE inhibitor and/or ARB first-line
<b>Cholesterol</b>	Total < 4.0 mmol/L LDL < 2.5 mmol/L	Dietary advice Statins
<b>Blood glucose (for people with diabetes)</b>	Pre-prandial BSL 4.4–6.7 mmol/L HbA1c < 7.0%	Lifestyle modification Oral hypoglycaemics Insulin

The NHMRC also recommends immunisation against influenza and invasive pneumococcal disease for people with diabetes and/or end stage kidney disease.