

**Chronic Kidney  
Disease (CKD)  
Management in  
General Practice**



**SUMMARY GUIDE**

Prevention • Support • Research

**kidney Health**  
NEW ZEALAND

0800 KIDNEY (0800 543 639) [www.kidneys.co.nz](http://www.kidneys.co.nz)

*Incorporating guidance from KHA-CARI Guidelines [www.cari.org.au](http://www.cari.org.au) and the New Zealand Primary Care Handbook 2012  
Revised October 2013*

## Early detection of CKD using kidney health check

### Who is at higher risk of kidney disease?

- Age > 60 years if other risk factors present
- Diabetes
- High blood pressure
- Cardiovascular disease
- Smoking
- Obesity
- Family history of kidney disease
- Maori and Pacific people
- South Asians

### What should be done?

- Serum creatinine to determine eGFR
- Urine protein test - ideally albumin/creatinine ratio (UACR) on first void specimen
- Blood pressure

### How often?

- **If CKD not present**  
At least every 1-2 years
- **If Diabetes or CKD present**  
At least every 12 months

*Adapted from KHA-CARI Early CKD Guidelines 2013.*

### Definitions of Albuminuria and Proteinuria

Kidney damage stage	Urine albumin/creatinine ratio (mg/mmol)	24h urine albumin (mg/day)	Urine protein/creatinine ratio (mg/mmol)	24h urine protein (mg/day)
Normalalbuminuria	Male <2.5 Female <3.5	<30	Male <4 Female <6	<50
Microalbuminuria	Male 2.5-25 Female 3.5-35	30-300	Male 4-40 Female 6-60	50-500
Macroalbuminuria	Male >25 Female >35	>300	Male >40 Female >60	>500

*If first void specimen not possible use a "spot" (random) urine*

*IF UACR positive, repeat 1-2 times over 3 months for confirmation*

*If eGFR<60mL/min/1.73m<sup>2</sup>, repeat test within 14 days. Small fluctuations in GFR are common and are not necessarily indicative of progression*

*Clinically significant change in eGFR - drop of 20% or greater from baseline measure*

## Clinical action plan

Based on a combination of kidney function (eGFR) and kidney damage (albuminuria/proteinuria)

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**: <ul style="list-style-type: none"> <li>• blood pressure</li> <li>• assessment of proteinuria</li> <li>• urinalysis</li> </ul> Cardiovascular risk reduction: <ul style="list-style-type: none"> <li>• blood pressure</li> <li>• lipids</li> <li>• blood glucose</li> <li>• lifestyle modification (smoking, weight, physical activity, nutrition, alcohol)</li> </ul>
60-89	Stage 2 CKD - kidney damage* with mild ↓ kidney function	As above, plus: <ul style="list-style-type: none"> <li>• monitor eGFR 3 monthly</li> <li>• avoid nephrotoxic drugs</li> <li>• prescribe antiproteinuric drugs (ACE inhibitors or ARBs) if appropriate</li> <li>• address common complications</li> <li>• ensure drug dosages appropriate for level of kidney function</li> <li>• consider indications for referral to a nephrologist</li> </ul>
45 - 59	Stage 3a CKD - mild-moderate ↓kidney function	As above plus: Refer patients with diabetes to nephrology
30-44	Stage 3b CKD - moderate-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 - 29	Stage 4 CKD - severe ↓ kidney function	As above + referral to a nephrologist
< 15	Stage 5 CKD - end-stage kidney disease	As above + referral to a nephrologist

\* imaging or biopsy abnormalities, or proteinuria/haematuria

\*\* hypertension, diabetes, smoker, age > 60 yrs, obesity, family history of kidney disease, Maori and Pacific people, South Asians

### Clinical tip

Avoid combination of ACE inhibitors and ARBs

## Referral to a nephrologist is not necessary if

- Stable eGFR  $\geq 30$  mL/min/1.73m<sup>2</sup>
- Urine ACR <30 m/mmol (with no haematuria)
- Controlled blood pressure

The decision to refer or not must always be individualised, and particularly in younger individuals the indications for referral may be less stringent.

### Tips for referral:

- Familiarise yourself with your local nephrology unit's referral guidelines
- Don't refer to a nephrologist if targets of therapy are achieved.
- Pay attention to CVD risk reduction.
- Consider discussing management issues with a nephrologist in cases where uncertainty regarding referral exists.

#### Clinical tip

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

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## 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 should usually be referred to a nephrologist?

### Anyone with

- eGFR  $<30\text{mL}/\text{min}/1.73\text{m}^2$ \*
- Persistent significant albuminuria (urine ACR  $\geq 30\text{mg}/\text{mmol}$ )
- A consistent decline in eGFR from a baseline of  $<60\text{mL}/\text{min}/1.73\text{m}^2$  (a decline  $>5\text{mL}/\text{min}/1.73\text{m}^2$  over a six-month period which is confirmed on a least three separate readings)
- Glomerular haematuria with macroalbuminuria
- CKD and hypertension that is hard to get to target despite at least three anti-hypertensives
- Diabetes with eGFR  $<45\text{mL}/\text{min}/1.73\text{m}^2$ \*\*

\* Referral may not be appropriate if eGFR stable, proteinuria minor and cardiovascular risk reduction achieved

\*\* New Zealand Primary Care Handbook 2012

[www.health.govt.nz/publication/new-zealand-primary-care-handbook-2012](http://www.health.govt.nz/publication/new-zealand-primary-care-handbook-2012)

### Clinical tip

Urine protein:creatinine ratio of  $100\text{ mg}/\text{mmol}$   $\equiv$  daily protein excretion of  $1\text{g}/24\text{hrs}$

# Treatment targets for people with CKD

Parameter	Target	Treatment and effects on systolic BP
<b>Lifestyle Factors</b>		
Smoking	Cease smoking	Lifestyle modification - refer to <i>New Zealand Primary Care Handbook 2012*</i>
Weight	BMI at least $\leq 30$ and ideally $\leq 25$ kg/m <sup>2</sup> Waist circ males < 102 cm Waist circ females < 88cm	Lifestyle modification - refer to <i>Handbook</i> SBP reduction 5-20 mmHg $\approx$ 10 kg loss
Physical activity	$\geq 30$ mins moderately intensive physical activity/day (3-6 METs)	Lifestyle modification - refer to <i>Handbook and "Green Prescriptions"***</i> SBP reduction = 4-9 mmHg
Nutrition	Dietary salt intake $\leq 100$ mmol/day (6g salt/day)  Dietary protein intake - normal protein diet (0.75 - 1.0 g/kg/day, with adequate energy). Low protein diet not recommended	Lifestyle modification - refer to <i>Handbook</i> SBP reduction = 2-8 mmHg
Alcohol	Reduce long-term health risks by drinking no more than: <ul style="list-style-type: none"> <li>• 2 standard drinks a day for women and no more than 10 standard drinks a week</li> <li>• 3 standard drinks a day for men and no more than 15 standard drinks a week</li> </ul> AND at least two alcohol-free days every week	Lifestyle modification - refer to <i>Health Promotion Agency***</i> Recommended upper limits for safer drinking  SBP reduction = 2-4 mmHg
<b>Clinical Factors</b>		
Blood pressure	$\leq 140/90$ mmHg $\leq 130/80$ mmHg if albuminuria or diabetes	Lifestyle modification ACE inhibitor or ARB first line therapy Combination therapy with both ACEs and ARBs should be avoided
Proteinuria	>50% reduction of baseline value	ACE inhibitor or ARB first line therapy
Lipids	Total cholesterol <4.0 mmol/L LDL cholesterol <2.0 mmol/L HDL cholesterol $\geq 1.0$ mmol/L Triglycerides <1.7 mmol/L	Drug treatment and specific lifestyle advice* Treatment based on individual cardiac risk* Statins less effective with advanced CKD
Blood glucose (for people with diabetes)	Pre-prandial BSL 4.0 - 6.0 mmol/L HbA1c <53 mmol/mol	Lifestyle modification* Oral short-acting hypoglycaemics Insulin Use metformin with caution if GFR 30-60 mL/min/1.73m <sup>2</sup> Avoid if GFR <30 mL/min/1.73m <sup>2</sup>

Consider immunisation against influenza and invasive pneumococcal disease for people with diabetes or CKD.

## Golden Rules!

People with moderate or severe CKD are at very high risk of a CVD event

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


\*[www.health.govt.nz/publication/new-zealand-primary-care-handbook-2012](http://www.health.govt.nz/publication/new-zealand-primary-care-handbook-2012)

\*\*[www.health.govt.nz/our-work/preventative-health-wellness/physical-activity/green-prescriptions](http://www.health.govt.nz/our-work/preventative-health-wellness/physical-activity/green-prescriptions)

\*\*\*[www.alcohol.org.nz](http://www.alcohol.org.nz)

## Prognosis of CKD by GFR and albuminuria category\*

Kidney function stage	GFR (mL/min/1.73m <sup>2</sup> )	Albuminuria stage		
		Normal (urine ACR mg/mmol) Male: < 2.5 Female: < 3.5	Microalbuminuria (urine ACR mg/mmol) Male: 2.5-25 Female: 3.5-35	Macroalbuminuria (urine ACR mg/mmol) Male: > 25 Female: > 35
1	≥90	Not CKD unless haematuria, structural or pathological abnormalities present		
2	60-89			
3a	45-59			
3b	30-44			
4	15-29			
5	<15 or on dialysis			

Risks of progressive CKD denoted as low , moderate , high , and very high 

\* Johnson DW, Atai E, Chan M, Phoon KS, Scott C, Toussaint ND, et al. KHA-CARI Guideline: Early chronic kidney disease: detection, prevention and management. Nephrology 2013; 18: 340-350.

## Interpreting tests of GFR and albuminuria

- For patients with CKD, the combination of a low GFR and albuminuria or proteinuria places them at a greater risk of CKD progression at all ages, than those with just low GFR or albuminuria/proteinuria
- Repeated testing is needed to pick up the patient with rapidly deteriorating kidney function (a sustained decline in eGFR of more than 5ml/min/1.73m<sup>2</sup>/yr)
- A measured or estimated GFR <45mL/min/1.73m<sup>2</sup> is associated with increased risks of adverse renal, cardiovascular and other clinical outcomes, irrespective of age

# 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 + Anaemia Sleep Apnoea CVD Malnutrition	As for stage 3 + Hyperphosphataemia Acidosis Hyperkalaemia Restless legs	As for stage 4 + Pericarditis Encephalopathy Neuropathy
<b>Clinic Assessment</b>	BP Weight Urinalysis		As for stage 1-2	As for stage 1-2 + Fluid overload	As for stage 4
<b>Lab Assessment</b>	General chemistry, eGFR Glucose Lipids Albuminuria or proteinuria		As for stage 1-2 + FBC Iron stores Ca/PO4 PTH (repeat test on nephrologist advice)	As for stage 3 + plasma bicarbonate	As per monthly blood schedule specified by Renal Unit
<b>Management</b>	Diagnosis (may require renal biopsy) Cardiac and kidney risk factor modification ≤ 140/90 or ≤ 130/80 if albuminuria or diabetes (Urine protein/creatinine 100 mg/mmol ≡ protein excretion of 1g/24hrs)		As for stage 1-2 + Treat complications Medication review	As for stage 3 + Education regarding treatment options including pre-emptive transplantation Dialysis access surgery	As for stage 4 + Dialysis or transplantation (or conservative medical management)
<b>Frequency of clinical review</b>	6 - 12 months Less frequently if eGFR stable and treatment targets met		3 - 6 monthly	3 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