

Managing Chronic Kidney Disease in Primary Care

National Consensus
Statement

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Executive summary

1. The purpose of this National Consensus Statement is to articulate best practice in the identification and management of chronic kidney disease (CKD) in primary care. It is intended as a guide for clinicians and managers in both funder and provider organisations.

Detection

2. To detect and manage chronic kidney disease (CKD), it is necessary to have systematic screening in primary care, linked with the current cardiovascular (CVD) and diabetes screening programme. This screening would involve adding **serum creatinine** and **urinary albumin:creatinine ratio (ACR)** to the current laboratory tests in cases where they have not been otherwise documented. High-risk groups require earlier assessment.
3. CKD should be classified from stage 1 to 5 and as stable or progressive.

Management

4. People with **stable CKD stages 3–4** are at > 20 per cent five-year CVD risk (with diabetes) or > 15 per cent five-year CVD risk (without diabetes). They need appropriate CVD risk management.
 - a. Target blood pressure is 140/90 or less without proteinuria or 130/80 or less with proteinuria.
 - b. Blood pressure management should start with an ACE inhibitor or angiotensin receptor blocker (unless contraindicated).
5. People with **progressive CKD stages 3–4** (rate of loss of GFR > 5 ml/min/year) have even higher CVD risk and a much higher risk of developing renal failure with need for dialysis or transplant. They must be intensively managed to reduce risk, which involves weekly or fortnightly risk factor management and review until stable. This approach could involve integrating nurse-led clinics into Long Term Conditions Management Programmes.
6. The great majority of patients, particularly those with **stable stage 3 CKD or who are older (> 75 years) with early stable stage 4 CKD**, can be fully managed in primary care. Note that prescribing of medication should be carefully considered.

Enablers/monitoring

7. Software-based decision support, audit and recall systems for best practice are part of best practice in the management of CKD.

Introduction

Chronic kidney disease (CKD) was identified in 2008 as an important health issue by the National Renal Advisory Board working in conjunction with Ministry of Health. It has been defined in the scoping paper entitled *New Zealand's Renal Services: Towards a national strategic plan*. (1)

The reasons for this initiative included the:

1. rising incidence and prevalence of end stage kidney disease (ESKD)
2. need to improve identification and management of CKD in primary care
3. need for effective national screening of at-risk patient groups
4. need for broad implementation of patient-centred strategies in primary care to manage most patients with CKD.

The Ministry of Health supported four pilot projects running over two years that used innovative approaches to electronic screening and referral for CKD, and nurse-led clinics in primary care focused on intensive management of CKD.

The results of these pilot projects and a separate randomised controlled trial (DEFEND, undertaken in Auckland with Māori and Pacific patients with diabetes and CKD) led to a National Consensus conference on CKD held at Matakana in 2013.

Participants included diabetes specialists, nephrologists (renal physicians), family practitioners, nurses from primary and secondary care and Ministry of Health personnel.

This document has been prepared by the CKD Core Work Group. It summarises the conclusions and recommendations emerging from this consensus meeting. Its purpose is to articulate best practice in the identification and management of chronic kidney disease (CKD) in primary care. It is intended as a guide for clinicians and managers in both funder and provider organisations.

The classification of CKD

Chronic kidney disease is a general term for chronic disorders that affect kidney structure and function. Complications from CKD may in time affect all organ systems. However, most people with mild or moderate CKD have no symptoms.

CKD is classified using the criteria of the Kidney Disease Improving Global Outcomes Foundation (KDIGO) CKD Consensus Consortium (Figure 1). The classification is independent of the underlying cause of the kidney disease. Each stage is characterised by a glomerular filtration rate (GFR) range. The GFR is an estimate of kidney function based on serum creatinine as measured by the laboratory.

Patients in stages 1 and 2 CKD have documented kidney disease (eg, diabetic nephropathy or polycystic kidney disease) and are sub-classified by GFR. Patients in stages 3–5 have reduced GFR on which the classification is based. Because GFR declines in the overall population by 1 ml/minute/year, many elderly patients have reduced GFR and so meet the criterion for CKD stage 3. Most of these patients, however, do not show any evidence of active or structural kidney disease. In such cases, a kidney biopsy is likely to reveal sclerotic changes affecting renal vessels, glomeruli and interstitium (arteriolonephrosclerosis) which might be described as ageing-related.

Table 1: CKD classification and prognostic risk from the KDIGO CKD Consensus Consortium (2)

Prognosis of CKD by GFR and Albuminuria Categories: KDIGO 2012 (units changed to SI)				Persistent albuminuria categories Description and range		
				A1 Normal to mildly increased < 3 mg/mmol	A2 Moderately increased 3–30 mg/mmol	A3 Severely increased > 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	Kidney failure	< 15			

Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red: very high risk.

Risks of CKD

CKD is associated with increased cardiovascular (CVD) and cerebrovascular risk and premature death. The presence of albuminuria is a marker of increased CVD risk as well as renal injury.

Table 2 Pooled analysis showing relative risk controlled for multiple co-variables from the CKD Consensus Consortium (1)

	All-cause mortality				Cardiovascular mortality			
	ACR < 1	ACR 1-3	ACR 3-30	ACR ≥30	ACR < 1	ACR 1-3	ACR 3-30	ACR ≥30
eGFR > 105	1.1	1.5	2.2	5.0	0.9	1.3	2.3	2.1
eGFR 90-105	Ref	1.4	1.5	3.1	Ref	1.5	1.7	3.7
eGFR 75-90	1.0	1.3	1.7	2.3	1.0	1.3	1.6	3.7
eGFR 60-75	1.0	1.4	1.8	2.7	1.1	1.4	2.0	4.1
eGFR 45-60	1.3	1.7	2.2	3.6	1.5	2.2	2.8	4.3
eGFR 30-45	1.9	2.3	3.3	4.9	2.2	2.7	3.4	5.2
eGFR 15-30	5.3	3.6	4.7	6.6	14	7.9	4.8	8.1

Note: The ACR is in SI units and has been converted from North American units in the original.. A microalbuminuria to urine albumin/creatinine (ACR) ratio of 3–30 mg/mmol (the microalbuminuria range) is equivalent to 30–299 in North American units.

Numbers of people with CKD

In New Zealand at the end of 2012, there were 2469 dialysis patients and 1520 successfully transplanted patients.(3) During that year, 513 commenced dialysis or had a pre-emptive kidney transplant. The number of treated dialysis patients has risen steadily throughout the history of this treatment. For example, in 2000 there were 1336 patients on dialysis compared with 2469 at the end of 2012, representing an increase of 84 per cent in 12 years. About half of all dialysis patients have diabetes as a primary cause. The cost to the health care system of dialysis for an individual ranges from \$30,000 to \$60,000 per year.

Currently in New Zealand the number of adults with CKD is unknown. According to data from elsewhere, including the USA, European and Asian countries, there is a prevalence of 7–10 per cent of the adult population. Assuming a prevalence of 7 per cent, there would be about 210,000 adult New Zealanders with CKD. However, fewer than 2 per cent of these will ultimately require renal replacement therapy (dialysis and/or kidney transplantation). In contrast, most are at increased risk for cardiovascular disease and/or death.

High-risk ethnic groups

Māori, Pacific and Indo Asian peoples have much higher rates of diabetes, CKD and ESKD than other ethnic groups in New Zealand. Achieving the early detection and management of diabetes and CKD for people of these ethnicities is a significant challenge for our health system.

It is necessary for health teams to establish relationships with Māori, Pacific and Indo Asian peoples as individuals, whānau, families and communities. Developing these relationships might include working with leaders of churches or marae. Long-term relationships, not only with individuals but also on a collective basis, underpin all successful long-term care. Without them, health teams will fail to engage with those individuals and families most in need.

Detection in primary care

CKD is usually first identified following tests arranged by primary care clinicians. An important challenge in primary care is to identify, and then carefully manage, the minority with progressive CKD. Although the average rate of loss of GFR with age is about 1 ml/min/year, patients with progressive CKD may lose kidney function at much faster rates, often as high as 10–20 ml/min/year.

Risk factors for CKD

Risk factors for CKD are:

- hypertension
- diabetes
- BMI > 35
- cardiovascular disease
- family history of kidney disease
- prostatic syndrome/urologic disease
- nephrotoxic drugs
- Māori, Pacific or Indo Asian ethnicity
- age over 60 years.

Screening everyone with a single demographic risk factor for CKD as an independent clinical activity is not feasible in primary care. A realistic alternative is to test those identified according to their risk of CKD as part of a CVD risk assessment or diabetes check.

The individual's risk factors for CKD should be considered when deciding whether to arrange screening for CKD with a serum creatinine (and eGFR) and urine ACR.

Management in primary care

It is now clear that CKD needs to be addressed under the umbrella of better management of long-term conditions in primary care. Many patients can be fully managed in primary care but, for a minority, management requires discussion with renal services for advice and further management. An important focus of secondary renal and diabetes services should be to work innovatively together with primary care to ensure that all clinicians are well supported in their provision of optimal renal care.

Guidelines for the management of CKD are well established. However, implementation of best practice for CKD in primary care settings is challenging because:

- the implementation of decision-support tools based on current guidelines is variable
- incorporating detection and management of CKD into primary practice patterns is a complex process
- effectively collaborating with patients to make significant lifestyle changes involves considerable skill and time
- high-risk patients with progressive CKD need a focused case-management approach.

Goals for best practice in managing CKD

- Those people with, or at risk of, progressive CKD are identified and effectively managed.
- Cardiovascular risk is reduced through optimal lifestyle modification, smoking cessation, blood pressure control, glycaemic control, and use of statins.
- Effective blood pressure control reduces albuminuria and slows the rate of decline of eGFR in many patients.
- The incidence and prevalence of CVD, progressive CKD and ESKD, and their associated morbidity and mortality rates, fall over time.

The role of primary care

As people age, GFR slowly falls to the point that, by the age of 70 years, some 30 per cent of the population could be classified as having CKD. However, most of these individuals do not have progressive CKD and further loss of renal function is slow. In contrast, those with diseases such as diabetic nephropathy can lose kidney function at a rate of 10–20 ml/min/year and rapidly progress towards ESKD.

Primary care has an important role in distinguishing between:

- the majority with stable CKD, who require standard management of their blood pressure, blood sugars, care with drug dosing and attention to cardiovascular risk reduction
- the minority with or at high risk of progressive CKD, who need to be closely and often intensively supervised.

The great majority of patients, particularly those with stable stage 3 CKD or who are older (> 75 years) with early stable stage 4 CKD, can be fully managed in primary care, taking into account their age and whether they have stable or progressive CKD.

Recommended management practice

- Facilitate dietary and lifestyle modification to reduce cardiovascular risk: stop smoking, reduce salt in diet, and reduce BMI through diet and exercise.
- Encourage patients to get involved in their own self-management. Those who are well informed and motivated feel empowered and more in control.
- Manage blood pressure to recommended targets (140/90 mmHg or less, or 130/80 mmHg or less in proteinuric CKD), initially with ACE inhibitors or angiotensin receptor blockers. Managing blood pressure reduces the progression of CKD as well as lowering the risk of cardiovascular events.
- In elderly patients (age > 70–75 years), blood pressure < 150/90 may be a reasonable target, reached gently. Monitor more closely for adverse events (electrolyte disorders, acute decline in GFR, postural hypotension and drug side effects).
- Manage diabetes to targets appropriate to CKD disease stage. (Because there is a significant risk of hypoglycaemia in advanced stages 4 and 5 CKD, less intensive blood sugar control may be appropriate and it is necessary to closely supervise and adjust (often reduce) hypoglycaemic agents accordingly.)
- Use statins and aspirin according to guidelines to reduce cardiovascular risk.
- Ensure all patients with progressive CKD have ongoing monitoring and management with:
 - blood pressure measurement and optimisation (follow-up may be needed every two to four weeks in the early stages to achieve optimal blood pressure as noted above). Many patients require two or three anti-hypertensive agents, and advice on sodium restriction to < 100 mmol/day is essential for most)
 - laboratory measures of serum creatinine/eGFR and urine albumin/creatinine (or protein/creatinine) ratio every three months and after introduction of ACE inhibitors/ARBs or diuretics)
 - additional laboratory monitoring as indicated by the stage of CKD (4).
- Intensively manage those patients identified as at high risk – those who, despite standard care, have uncontrolled blood pressure, or rapid loss of renal function. These patients are a minority, but are at greatest risk of adverse outcomes including significantly increased cardiovascular risk and progression to ESKD.

Referral to specialist services

Most DHBs offer indications for referral to renal (nephrology) and/or diabetes services. See Kidney Health New Zealand's *Chronic Kidney Disease Management in General Practice* (5) for additional guidance.

Refer patients for:

- intrinsic kidney disease (eg, glomerulonephritis, polycystic kidney disease or interstitial nephritis) where specialised diagnosis and management are required
- drug-resistant hypertension and/or significant issues with blood glucose control and/or multiple microvascular complications
- progressive stages 3B and 4 CKD. As well as focusing on delaying progression of CKD, the renal team will address disorders associated with advanced CKD (acidosis, bone mineral disease, anaemia and increased risks of infection and acute kidney injury, nutritional issues and the need to prepare for renal replacement therapies or conservative management).

Where primary care clinicians are uncertain about management or referral, it is highly recommended that they use telephone consultations and/or 'virtual' referrals.

Examples of implementing best practice in CKD management in primary care

Recent pilot projects and the DEFEND randomised controlled trial (6) have demonstrated the effectiveness of complementary strategies to implement improved management of CKD in primary care and collaboration with secondary care. In particular:

- an electronic desktop tool has been used to facilitate the detection and management of CKD in a primary care setting
- nurse-led clinics involved intensive management of those identified as high-risk CKD patients within a primary care setting
- the DEFEND study involved a randomised controlled trial of intensive renal nurse-led management to delay progression of CKD in Māori and Pacific patients with established stage 3 or 4 diabetic nephropathy. Health care assistants (community health workers), under the supervision of a nurse specialist and physicians, visited patients at home or at work to encourage them to adhere to their medication and adjusted medication according to an algorithm. (6)

Key enablers in CKD management

CKD can only be effectively managed in primary care as one aspect of the management of the range of long-term conditions. Primary care clinicians can easily incorporate the identification of CKD into CVD risk assessment and diabetes checks.

To manage CKD effectively, primary care practices need suitable electronic support (see Appendix 1), including:

- information systems to identify, register, monitor and appropriately recall all people with CKD in the practice
- an electronic tool offering a clear decision pathway that supports best practice management of CKD
- audit supported by their primary health organisation to provide useful feedback on the practice's performance in a continuous quality improvement (CQI) environment.

Nurse-led clinics for people with long-term conditions can undertake intensive management of people identified at high risk of progressive CKD (see Appendix 2). To manage CKD in primary care, practice nurses need to be able to work to their scope of practice. This requires:

- specialist nurses from secondary care based in renal departments to upskill practice nurses in CKD management
- innovative funding models that support primary care practices to enable their practice nurses to work with patients in nurse-led clinics within primary care.

Key stakeholder groups in CKD management

Improving care of people with CKD in primary care involves action from a range of groups in the health sector.

- **Primary health organisations (PHOs) and primary care practices** need to make the care of people with CKD an integral part of the assessment and management of CVD risk and diabetes. Because most patients with CKD can only be identified and effectively managed in primary care, managing stage 3 CKD is part of the core work of the primary care team.
- **Nephrology services** need to support primary care practices in the management of CKD, including through the development of senior nursing positions to lead work with primary care. Working with primary care services in the management of CKD is part of the core work of specialist renal services.
- **Diabetes services** need to support primary care practices in the detection and management of patients who have diabetes and CKD. Specifically diabetologists and diabetes nurse specialists need to work with primary care staff. Many of the patients who have diabetes and CKD have multiple complications.
- **Clinical and community pharmacists** need to dispense medications appropriately, ensuring patients collect their repeat prescriptions and advising about nephrotoxic medications and medications requiring dosage adjustments.
- **DHB funding and planning teams** need to promote the development of better management of CKD in primary care practices via their PHOs, as well as to develop their own secondary nephrology and diabetes services to support primary care practices. Given the financial savings to be made by managing CKD in primary care rather than ESKD in specialist care, this work will include innovative funding arrangements with PHOs, which are aligned with the management of CVD and diabetes in primary care, enabling the emergence of different practice patterns.
- **Professional groups (primary care, nephrology, diabetes)** need to lead in the development and dissemination of best practice guidelines that support innovative management of CKD in primary care.
- **Patient organisations** need to educate their members about the risks, detection and management of kidney disease.
- **The Ministry of Health** needs to include CKD management in primary care in guidance and link it to associated long-term conditions such as CVD and diabetes.

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CKD Core Work Group

John Collins, Renal Physician, Auckland DHB

Ailsa Jacobson, Senior Advisor, Ministry of Health

Nick Polaschek, Senior Project Manager, Ministry of Health

Helen Rodenburg, General Practitioner, National Director Long Term Conditions

Rachael Walker, Renal Nurse Practitioner, Hawke's Bay DHB

Appendix 1: Using software for CKD management in primary care

General principles for any software to be used for CKD management in primary care

An electronic decision support pathway for best practice management of CKD must:

- integrate with patient management systems (PMS) of the general practice
- assist in assessment of patients
- provide advice on management, including electronic referral to secondary care
- enable review of adequacy of the practice of detection and management of CKD in the local patient population.

Electronic desktop tool available for CKD management in primary care

The electronic desktop tool developed by the Best Practice Advocacy Centre (BPAC) to manage CKD is available free to primary care practices nationwide.

The tool is a clinical pathway, using a best practice approach informed by specialist renal expertise, including:

- staging of CKD and assessment of rate of change in renal function
- clinical advice on management of CKD, including blood pressure, anaemia, mineral metabolism, nephrotoxic medication adjustment
- recommended laboratory monitoring and clinical follow-up, generating forms and appointments
- electronic referral to secondary care where necessary, populated from electronic tool and PMS.

To be used successfully, such an electronic system needs to fit into current general practice work patterns through:

- single screens auto populating all relevant data from the main PMS
- minimising the care and documentation of the majority with stable CKD
- embedding an intuitive process of clinical decision support in a sequence of screens
- being integrated with e-referral so that it generates a letter to secondary care populated by all relevant data
- having the capacity for interrogation to identify all patients with certain diagnostic/management characteristics.

Challenges to implementation

Given electronic desktop tools for CKD management are now available, some of the challenges to implementation are to:

- secure any funding required for integration of electronic CKD management tools with general PMS
- educate primary care practitioners in the use of electronic CKD management tools
- promote the use of tools by PHOs to monitor the detection and management of CKD across local populations
- integrate e-referral with secondary care patient data systems.

Appendix 2: Nurse-led clinics to manage high-risk CKD patients

General principles for nurse-led clinics in CKD management

In this strategy for best-practice CKD management, a primary care nurse manages a group of high-risk CKD patients:

- through regular clinics that are identified in the primary care practice
- using an individualised programme with each patient
- supported by specialist secondary care nursing, as well as both primary care and specialist secondary care medical expertise
- aiming to improve identified risk factors for these patients.

During the clinics the nurse oversees the management of these high-risk CKD patients by:

- producing an individualised care plan based on a comprehensive assessment
- focusing on the education of patients about their condition and management
- monitoring and following up to optimise the management of key patient parameters such as blood pressure, blood glucose and cholesterol
- regularly reviewing progress toward clinical goals with the patient
- maintaining a patient database to enable audit of practice
- identifying patients who continue to progress towards ESKD despite optimal treatment.

To be used successfully, the nurse-led clinic needs to fit into current general practice work patterns through:

- systems that can readily identify suitable high-risk CKD patients and provide appropriate recall appointments
- availability of practice nurses who can include CKD clinics as part of their work in long-term conditions
- access to resources for patient education and protocols for patient management
- integration with medical management of CKD in primary care
- availability of specialist nurses to upskill practice nurses
- support from renal physicians, diabetes specialists and specialist nurses and dieticians.

Successful trial of one model of nurse-led care

In one successful model of nurse-led care, nurses have supervised community health workers who visit patients at home or work to encourage them to adhere to their medication and who adjust blood pressure medication according to an algorithm. This model was successfully trialled in Auckland in the DEFEND trial. (6)

Challenges to implementation

Given the current configuration of primary and specialist care, some of the challenges to implementation are to:

- secure funding of practice nurse time for free clinics for patients with long-term conditions
- make available appropriate and funded nursing courses for chronic disease management
- ensure the availability of specialist nurses and effective clinical support from secondary care renal and diabetes services to initiate clinics and upskill primary care nurses and general practitioners
- develop processes for mentoring practice nurses to upskill them to undertake clinics
- establish adequate protocols to integrate with medical management in primary and secondary care
- enable a fast-track referral for patients with progressive CKD.

Contributors

Janine Bycroft	Medical Director Health Navigator
Rachael Calverley	Director of Nursing and Workforce Development Waitemata PHO
John Collins	Renal Physician Auckland DHB
Tim Cundy	Professor of Medicine University of Auckland
Paul Drury	Clinical Director, Auckland Diabetes Centre, Chair National Diabetes Service Improvement Group
Maggie Fisher	Diabetes Physician Waikato DHB
Carmel Gregan-Ford	Education Manager Kidney Health New Zealand
Ailsa Jacobson	Senior Advisor Ministry of Health
Tim Kenealy	Associate Professor of Integrated Care, University of Auckland
Murray Leikis	Renal Physician Capital and Coast DHB
Hwyel Lloyd	Chief Medical Adviser, BPAC
Kelvin Lynn	Medical Director Kidney Health New Zealand
Donna McArley	Western Bay of Plenty PHO
Fifita McReady	Diabetes Nurse Tongan Health Society
Lois Nikolajenko	Clinical Nurse Specialist Diabetes Primary Health Care MidCentral DHB
Nick Polaschek	Senior Project Manager Ministry of Health
Helen Rodenberg	National Clinical Director Long Term Conditions Ministry of Health
Tracey Saweirs	Renal Nurse Specialist Northland DHB
Walaa Saweirs	Renal Physician Northland DHB
Ian Simpson	Renal Physician
Sandy Speedy	Renal Nurse Specialist Auckland DHB
Jasmine Tan	Jasmine Tan, Diabetes Fellow, Auckland Diabetes Centre
Chrissy Taylor	Renal Nurse Specialist Auckland DHB
Murray Tilyard	Professor General Practice University of Otago CEO BPAC
Villi Tutone	Renal Physician Counties Manukau DHB
Curtis Walker	Physician MidCentral DHB
Miranda Walker	Diabetes Nurse Specialist Capital and Coast DHB
Rachael Walker	Renal Nurse Practitioner Hawkes Bay DHB