

## Australian general practitioners' current practice for chronic kidney disease (CKD) detection and management

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### RESEARCH

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### ABSTRACT

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#### Background

Guidelines for early detection of chronic kidney disease (CKD) emphasise regular testing of kidney health in high-risk individuals. However, evidence suggests that CKD is not being adequately detected or appropriately managed in primary care.

#### Aims

Assess Australian general practitioners' (GP) current practice in relation to CKD detection and management.

#### Methods

This was a cross-sectional study utilising a random sample of GPs identified by interrogation of the national online telephone directory, and stratified by geographical location. Data collection occurred between October 2014 and January 2015. Of 2,815 eligible contacts, the final response rate was 23 per cent.

#### Results

Of the 656 respondents, over 90 per cent assessed kidney health at least annually in people with diabetes or high blood pressure, and 71 per cent correctly assessed kidney health every 3–6 months in a patient with Stage 3b CKD. The tests most commonly used to assess kidney health were serum creatinine (with eGFR), blood pressure and urine albumin creatinine ratio. The most commonly reported CKD management strategies were 'blood pressure reduction using pharmacological agents' (81 per cent) and 'glycaemic control if diabetes present' (64 per cent). Knowledge testing highlighted that 32 per cent of respondents were not able to correctly identify how to properly assess absolute cardiovascular risk, and this was significantly more common in more experienced GPs ( $p=0.003$ ).

#### Conclusion

The results indicate that Australian GPs are mainly practising in accordance with current guidelines for detection and management of patients with CKD, but with room for improvement in some areas.

#### Key Words

Renal disease, primary care, clinical guidelines

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#### What this study adds:

##### 1. What is known about this subject?

Australian evidence-based guidelines recommend regular testing of kidney health in high-risk individuals, and appropriate determination of absolute cardiovascular risk, but implementation appears to be sub-optimal.

##### 2. What new information is offered in this study?

This sample of GPs was mainly practising in accordance with current guidelines for detecting and managing CKD, but

there is still confusion regarding the assessment of absolute cardiovascular risk.

### 3. What are the implications for research, policy, or practice?

Understanding of the need to review medication, and the rationale for how and when to undertake an assessment of absolute cardiovascular risk are areas that would benefit from further focussed education in primary care.

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## Background

Chronic kidney disease (CKD) presents a significant public health problem in Australia. An estimated one in three Australian adults is at increased risk of developing CKD due to identified risk factors including high blood pressure and diabetes.<sup>1</sup> Population surveys have demonstrated that one in ten adults have existing evidence of CKD, but the vast majority of consumers and health professionals are unaware these individuals have this condition.<sup>2</sup> Research has shown that early detection and optimal management of CKD can reduce the otherwise potential deterioration in kidney function by up to 50 per cent, with significant benefit in reducing cardiovascular risk and improving quality of life.<sup>3</sup> As CKD is primarily asymptomatic, and screening the general population has not been shown to be cost-effective, current preventive guidelines recommend regular testing of kidney health in high-risk individuals.<sup>4,5</sup>

The usual setting for initial assessment and diagnosis of CKD is in general practice. However, evidence suggests that CKD is not always adequately detected or appropriately managed in primary care.<sup>6,7</sup> Best practice for early detection of CKD is based on the Kidney Health Check<sup>4</sup> comprising a blood test for serum creatinine to obtain the estimated glomerular filtration rate (eGFR), urine test for albumin creatinine ratio (ACR), and blood pressure. It is recommended that the Kidney Health Check be performed annually in individuals with diabetes or hypertension, and every two years for other high risk cohorts (established cardiovascular disease, smoker, obesity, family history of kidney failure, Aboriginal or Torres Strait Islander origin).<sup>4</sup>

The aim of this cross-sectional study was to assess self-reported current practice by Australian GPs in CKD detection and management, and to examine knowledge gaps using a case-study scenario.

## Method

### Recruitment methods

A total of 6,000 GPs were randomly selected from the Australia-wide electronic Yellow Pages, using the search

term “General Practitioner” and “Medical Practitioner”. The sample was stratified by location into metropolitan and rural/remote. A total of 4,000 GPs were included in the initial mail-out, with 50 per cent of the sample from each location.

### Questionnaire

The 44-item questionnaire was developed by Kidney Health Australia, in consultation with a Project Reference Group consisting of representatives from primary care and nephrology. The questionnaire was formatted for both paper and online delivery (Voxco web survey platform) and was piloted by two GPs and two senior GP registrars.

### Procedure

The survey was mailed to 2,000 metropolitan-based GPs and 2,000 rural/remote-based GPs. Reminders were sent to all non-respondents three weeks and five weeks after the initial mail-out. The survey commenced in October 2014 and concluded in January 2015. To maximise response rates, a non-monetary incentive in the form of Royal Australian College of General Practitioners (RACGP) or Australian College of Rural and Remote Medicine (ACRRM) Continuing Professional Development (CPD) credits was offered to GPs. Participating GPs could use the completion of the survey as a component of a RACGP GP Individual Research Quality Improvement activity (40 Category 1 points) or an ACRRM Practice Reflective Professional Development (8 points) for the 2014-16 triennium.

### Data collection and analysis

All data were de-identified, cleaned and weighted to correct for the unequal sampling between GPs practising in metropolitan versus rural and remote locations. The latest distribution of GPs by location of practice was used to determine the correct weighting.<sup>8</sup> Findings presented here are based on the weighted data.

Analysis was undertaken using SPSS/PC statistical software. Statistical analyses (chi-square test and one-way analysis of variance (ANOVA)) were undertaken to determine significant differences ( $p < 0.05$ ) in relation to the following variables:

- Practice location: metropolitan, rural/remote.
- Gender.
- Number of years in practice.
- Country where basic medical training was obtained.

Unless otherwise stated in the text, there were no significant differences in relation to these variables.

## Results

Of the 4,000 GPs initially contacted to participate in the study, 1,185 identified as ineligible (deceased, retired, or not a GP) or were not contactable (invitation returned to sender with no forwarding). Of the 2,815 GPs eligible to participate, 656 responded (response rate 23 per cent).

As shown in Table 1, the majority of GPs who participated in the survey had been working in general practice for more than 20 years (73 per cent), were aged 41 to 70 years (85 per cent), were practising in a metropolitan area (70 per cent) and had obtained their basic medical qualification in Australia (74 per cent). In comparison with GP workforce data obtained from the Australian Department of Health,<sup>8</sup> the sample of participating GPs had an over-representation of males (59 per cent versus 56 per cent national average), older GPs (32 per cent aged over 60 years versus 13 per cent aged over 64 years), and those with basic qualifications obtained in Australia (74 per cent versus 60 per cent).

### Current practice - frequency of assessing kidney health

The majority of respondents (65 per cent) estimated 0 to 10 per cent of their practice population had CKD. Approximately one-third of GPs (38 per cent) estimated seeing up to five patients each week with CKD, while the remaining two thirds of respondents saw six or more patients with CKD per week. Consistent with current evidence-based recommendations,<sup>4</sup> 99.6 per cent of participating GPs indicated that they typically assessed kidney health in patients with diabetes at least once a year, and 94 per cent assessed patients with high blood pressure within a similar timeframe (Table 2).

As shown in Table 2, 71 per cent of GPs indicated their current practice was consistent with recommendations to assess people with Stage 3b CKD every three to six months. Eighteen per cent of respondents reported assessing kidney health less frequently than recommended, and these GPs were more likely to have over 20 years' experience in general practice (difference not significant at the 95 per cent confidence level).

### Current practice - method of assessing and managing kidney health

The tests most commonly used by participating GPs to assess kidney health (Table 3) were serum creatinine with eGFR (used by 99 per cent), blood pressure (89 per cent), and urine albumin creatinine ratio (79 per cent). The CKD management strategies most commonly reported by GPs were blood pressure reduction using pharmacological agents (used by 81 per cent) and glycaemic control for

people with diabetes (64 per cent) (Table 4). Avoidance of some medications and adjustment of doses were reported as CKD management strategies by 51 per cent and 45 per cent of respondents, respectively.

### CKD knowledge – case Study Scenario

#### Case study part one

*Rita, a 63 year old Caucasian female, is a new patient. She has a BMI of 29, mild intermittent asthma, chronic lower back pain, and hypertension (155/90 mmHg). Her family history reveals her maternal grandmother died of a heart attack in her 60s but also had a history of 'kidney problems'. Her mother has type 2 diabetes and her father has angina and hypertension. Rita smokes 20-25 cigarettes per day and consumes 1-2 glasses of wine on 3-4 nights per week. She has no known allergies and her only medications are Salbutamol 100mcg/dose as needed, and NSAIDs for her back pain.*

More than 90 per cent of respondents correctly selected hypertension (99.7 per cent), smoking (92 per cent), family history of kidney failure (92 per cent), and age over 60 years (92 per cent) as the four key indicators of increased risk of CKD. Only 1 per cent of participating GPs were not able to identify at least two of the risk factors.

The majority of participants were able to identify the three recommended tests used as part of the initial investigation for CKD: serum creatinine with eGFR (99 per cent), urine albumin creatinine ratio (89 per cent), and blood pressure (99 per cent). No significant differences were identified on these measures based on the location of practice, years working in general practice, or country of basic medical qualification.

#### Case study part two

*After appropriate investigations Rita is found to have an eGFR of 40 mL/min/1.73m<sup>2</sup> and an ACR of 37 mg/mmol. How do you best establish Rita's risk of experiencing a cardiovascular event in the near future?*

The correct answer (the patient is automatically at high risk of experiencing a cardiovascular event in the next 5 years as she has Stage 3b CKD) was nominated by 68 per cent of respondents, with 28 per cent of respondents erroneously indicating they would have used the Australian risk calculator to assess absolute cardiovascular risk, and a further 8 per cent indicating they would use individual risk factors to make the assessment and treat each risk factor on its merit (percentages sum to more than 100 per cent as respondents were able to indicate multiple responses).

Respondents who had been working in general practice for more than 40 years were significantly less likely to nominate the correct response on this question ( $p=0.003$ ).

## Discussion

The responding GPs were mainly practising in accordance with current guidelines for detection and management of CKD. The majority of participating GPs self-reported that they used the three-part Kidney Health Check to assess for CKD in patients with diabetes or hypertension on an annual basis, which is in accordance with the RACGP guidelines.<sup>4</sup> Compliance with current clinical practice guidelines for monitoring of patients with Stage 3b CKD was lower at 71 per cent, with 18 per cent of GPs indicating they were monitoring their patients with CKD less frequently than recommended. These GPs were more likely to have more than 20 years of experience in general practice, potentially reflecting issues with staying abreast of new evidence. As the majority of CKD is managed in primary care, these findings suggest that there remains an opportunity to educate primary care health professionals and improve the uptake of evidence-based CKD monitoring and management strategies.

Prioritised management strategies identified by the GPs were consistent with evidence-based guidelines,<sup>4</sup> and focussed on reducing both progression of kidney disease and cardiovascular risk with interventions including pharmacotherapy for blood pressure and glycaemic control, and medication review. Lifestyle modification for blood pressure control was mentioned by less than one-third of respondents, which is disappointing considering clinical guidelines recommend lifestyle advice for blood pressure control at all levels of cardiovascular risk.<sup>9</sup> Current guidance for GPs emphasises the importance of reviewing renally excreted medications and avoiding nephrotoxic medications in people with CKD.<sup>5</sup> Only half of the respondents identified these tactics in their top three management strategies for people with CKD.

Most participating GPs could identify CKD risk factors from a case study scenario. However, the case study also identified an issue with GP knowledge regarding absolute cardiovascular risk, particularly among more experienced GPs. Twenty-eight per cent of respondents erroneously indicated they would have used the Australian risk calculator to assess the risk of a cardiovascular event, even though the case study patient had documented Stage 3b CKD and was thus automatically classified as having a clinically determined high risk of cardiovascular disease.<sup>10</sup> Failure to recognise the presence of moderate to severe

CKD may lead to a serious under-estimation of cardiovascular disease risk. While blood pressure, lipids and lifestyle targets are identical for each category of cardiovascular risk, the use of pharmacotherapy and intensity of monitoring differs depending on the risk classification.<sup>9</sup>

The strengths of the study include the heterogeneity of participating GPs, the balance between metropolitan and rural/regional respondents, and the combination of subjective self-report behaviours with knowledge testing. However, study limitations must be acknowledged. The small sample size of this study reduced the ability to generalise these results to the wider GP population. Furthermore, comparison of the demographic characteristics of the sample with national GP workforce data revealed that the respondents were more likely to be older male GPs with medical qualifications obtained in Australia. The inability to assess the CKD knowledge of less-experienced GPs and GP Registrars restricted broader conclusions regarding the proportion of GPs who are providing guideline concordant care. Adherence to clinical guidelines was also potentially over-estimated due to self-report bias (where participants over-stated what they would do in clinical practice), and selection bias (respondents self-selected to participate and were therefore inherently more engaged in this topic). The self-report survey methodology was unable to delineate actual clinical practice from participant self-reported behaviour. Further research is needed to identify barriers that prevent knowledge from being translated into clinical care.

## Conclusion

The majority of GPs in this sample were familiar with the current guidelines about diagnostic testing and management strategies for CKD, and reported they were undertaking this evidence-based care in their clinical practice. Understanding of the need to review medication, the rationale for how and when to undertake an assessment of absolute cardiovascular risk, and the frequency of monitoring kidney health in individuals at risk of CKD are areas that would benefit from further focussed education in primary care. This study also identifies potential target groups for further education about guidelines for CKD monitoring and management.

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## References

1. Chadban SJ, Briganti EM, Kerr PG, et al. Prevalence of kidney damage in Australian adults: The AusDiab kidney study. *J Am Soc Nephrol.* 2003;14:S131-S138.

2. Australian Bureau of Statistics. Australian Health Survey: Biomedical Results for Chronic Diseases, 2011-12. ABS, Canberra; 2013.
3. Johnson DW. Evidence-based guide to slowing the progression of early renal insufficiency. *Intern Med J.* 2004;34(1-2):50-7.
4. Royal Australian College of General Practitioners. Guidelines for preventive activities in general practice (8th edition). The Royal Australian College of General Practitioners, South Melbourne, Australia; 2012.
5. Chronic Kidney Disease (CKD) Management in General Practice (3rd edition). Kidney Health Australia, Melbourne; 2015.
6. Howard K, Salkeld G, White S, et al. The cost-effectiveness of early detection and intervention to prevent the progression of chronic kidney disease in Australia. Kidney Health Australia, Melbourne, Australia; 2006.
7. Pilotto LSJ, Ball PA, Smithard JM, et al. Electronic records suggest suboptimal management of chronic kidney disease in general practice. *Aust J Rural Health.* 2012;20(4):195-9.
8. Australian Government Department of Health. GP Workforce Statistics - 2004-5 to 2014-15. <http://www.health.gov.au/internet/main/publishing.nsf/content/general+practice+statistics-1>.
9. National Vascular Disease Prevention Alliance. Guidelines for the Management of Absolute Cardiovascular Disease Risk. 2012.
10. National Vascular Disease Prevention Alliance. Guidelines for the Assessment of Absolute Cardiovascular Disease Risk. 2009.

## **ETHICS COMMITTEE APPROVAL**

National Research and Evaluation Ethics Committee of the Royal Australian College of General Practitioners (RACGP) - approval number: NREEC 14-013.

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## **PEER REVIEW**

Not commissioned. Externally peer reviewed.

## **CONFLICTS OF INTEREST**

The authors declare that they have no competing interests.

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**Table 1: Characteristics of participating general practitioners**

	<b>N (Percentage (%) of respondents)</b>
<b>Age</b>	
40 yrs or less	40 (6)
41-50 yrs	133 (21)
51-60 yrs	265 (4)
61-70 yrs	142 (23)
71-80 yrs	38 (7)
More than 80 yrs	11 (2)
<b>Gender</b>	
Male	389 (59)
Female	240 (41)
<b>Years working in general practice</b>	
Less than 10 yrs	61 (9)
11-20 yrs	118 (17)
21-30 yrs	228 (36)
31-40 yrs	175 (28)
More than 40 yrs	47 (9)
<b>Location of main clinical practice</b>	
Metropolitan	313 (70)
Rural	303 (29)
Remote	13 (1)
Received basic medical qualification in Australia	458 (74)
<b>Estimated proportion of patients in practice with chronic kidney disease</b>	
0-10%	406 (65)
11-20%	175 (27)
21-30%	43 (7)
More than 30%	5 (1)
<b>Estimated number of patients seen each week with chronic kidney disease</b>	
0-5	214 (38)
06-10	215 (32)
11-15	117 (17)
16-20	40 (7)
21-25	26 (4)
More than 25	17 (2)

**Table 2: Frequency of assessing kidney health in patients with diabetes, hypertension, or Stage 3b chronic kidney disease**

How often kidney health assessed:	In patients with:	
	Diabetes N (%)	Hypertension N (%)
Every 3 months	143 (20.7)	24 (3.6)
Every 6 months	315 (48.7)	212 (32.9)
Every year	<i>189 (30.2)</i>	<i>374 (59.1)</i>
Every second year	2 (0.3)	29 (4.4)
Once	0 (0.0)	8 (1.4)
Never	1 (0.1)	3 (0.6)
How often kidney health assessed:	In patients with Stage 3b chronic kidney disease N (%)	
Every 1-2 months	73 (11.4)	
Every 3-6 months	<i>463 (71.0)</i>	
Every 6-9 months	88 (13.5)	
Every year	23 (3.4)	
Every second year	2 (0.4)	
Never	1 (0.2)	

Text in italics shows response consistent with evidence-based recommendations<sup>4</sup>

**Table 3: Tests identified by general practitioners as their top three methods used to assess kidney health**

Test	Percentage (%) of respondents
Creatinine (with eGFR)	98.5
Blood pressure	88.6
Urine albumin creatinine ratio	79.8
Full blood count	16.9
Times urine collection for albumin excretion	9.1
Urine protein creatinine ratio	6.4
Timed urine collection for creatinine excretion	5.9
Urine protein dipstick	5.6
Urine albumin dipstick	5.1

**Table 4: Management strategies identified by general practitioners as their top three actions for their patients with chronic kidney disease**

Management strategy	Percentage (%) of respondents
Blood pressure reduction - pharmacological	81.3
Glycaemic control in diabetics	64.3
Avoidance of some medications	50.9
Adjustment of some medication doses	44.7
Assess absolute cardiovascular risk	32.1
Blood pressure reduction - lifestyle	28.1
Lipid lowering - statin	10.4
Immediate referral to a nephrologist	9.1