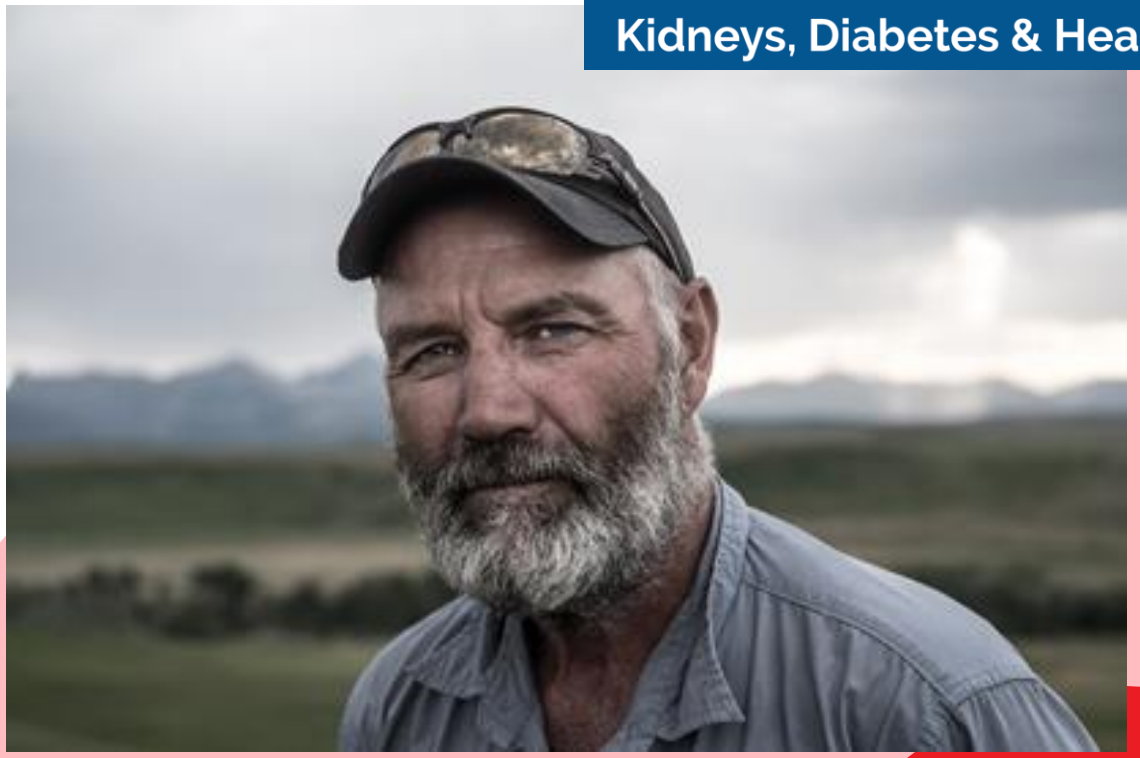
Chronic Kidney Disease, Diabetes & Cardiovascular Disease: make the link

MAKE THE LINK
Kidneys, Diabetes & Heart



Primary Care Education Workshop

This module was conceived and developed by PEAK*

Presented by:

Kidney Health® Australia

CLINICALLY REVIEWED & ENDORSED

Acknowledgement of Country

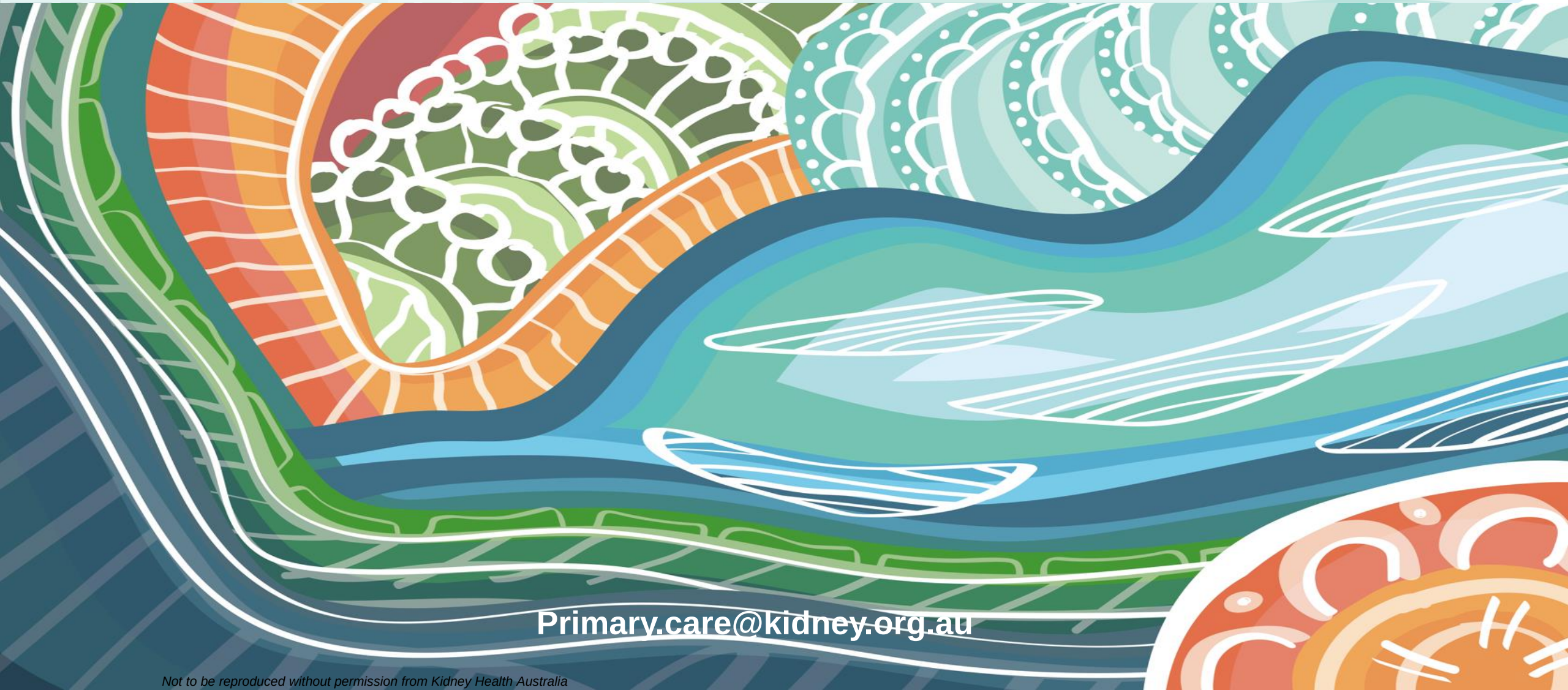
Recognition

Thanks to the ‘Primary Care Education Advisory Committee for Kidney Health Australia’ (PEAK) who has developed and reviewed this education.

Thanks to our volunteer presenters!

This educational program is supported by a sponsorship provided by Boehringer Ingelheim and Eli Lilly Alliance.

Housekeeping

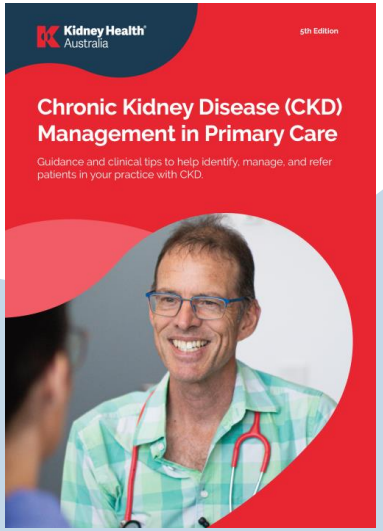


Primary.care@kidney.org.au

This education has been developed in reference to the Kidney Health Australia **Chronic Kidney Disease Management in Primary Care 5th edition handbook.**

To enhance your learning experience please download the app version **CKD Go!**

from your iPhone or Android app store.



Why use the CKD Management handbook app?

Chronic Kidney Disease (CKD) management in Primary Care handbook provides best practice recommendations for detecting and managing CKD in primary care:

- ✓ Easy to use and interactive.
- ✓ Colour coded CKD staging table.
- ✓ Colour coded clinical action plans outlining goals of management, key management tasks and treatments to slow the progression of CKD.
- ✓ Medication advice and treatment targets.
- ✓ Management framework for common CKD complications.
- ✓ Nephrology referral algorithm.
- ✓ Links to additional resources for you and your patients.

Learning aim

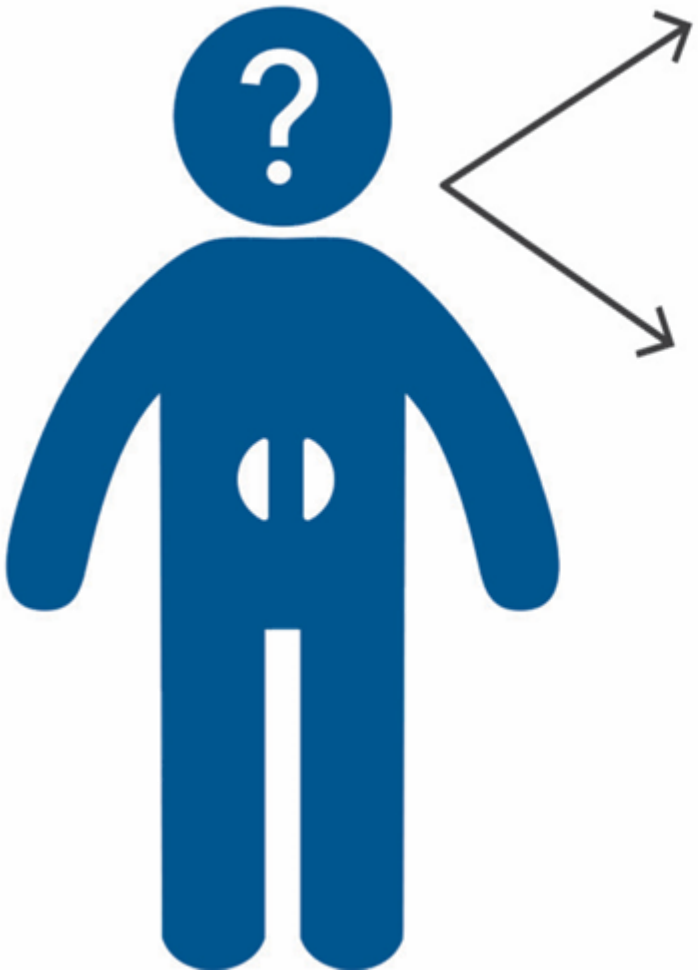
Apply the Kidney Health Check to the early detection of Chronic Kidney Disease (CKD) in primary care using optimal management of CKD to slow or halt disease progression.

Learning outcomes

At the end of this workshop participants will be able to:

- Explain how chronic kidney disease, diabetes, and cardiovascular disease interact and influence each other.
- Outline the three elements of a targeted CKD assessment (Kidney Health Check) for at risk groups.
- Identify individuals at risk of CKD who should be offered a Kidney Health Check.
- Identify the correct clinical action plan to follow according to an individual's CKD stage.

What is CKD?



CKD is defined as…

An estimated or measured glomerular filtration rate (GFR) <60 mL/min/1.73m² that is present for ≥3 months with or without evidence of kidney damage.

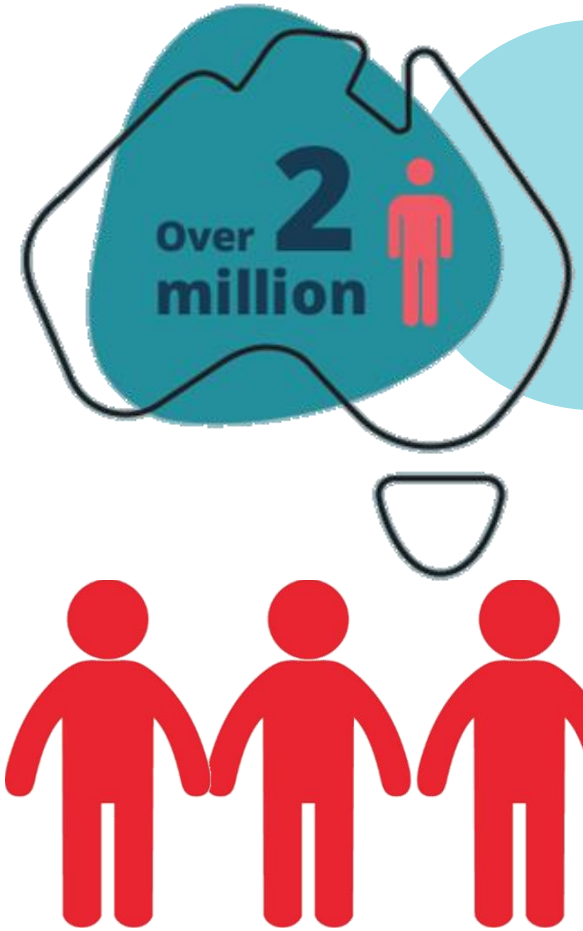
Or

Evidence of kidney damage with or without decreased GFR that is present for ≥3 months as evidenced by the following, irrespective of the underlying cause:

- Albuminuria
- Haematuria after exclusion of urological causes
- Structural abnormalities (e.g. on kidney imaging tests)
- Pathological abnormalities (e.g. renal biopsy)

Chronic Kidney Disease (CKD) Management in Primary Care, 5th edition. Kidney Health Australia: Melbourne, 2024

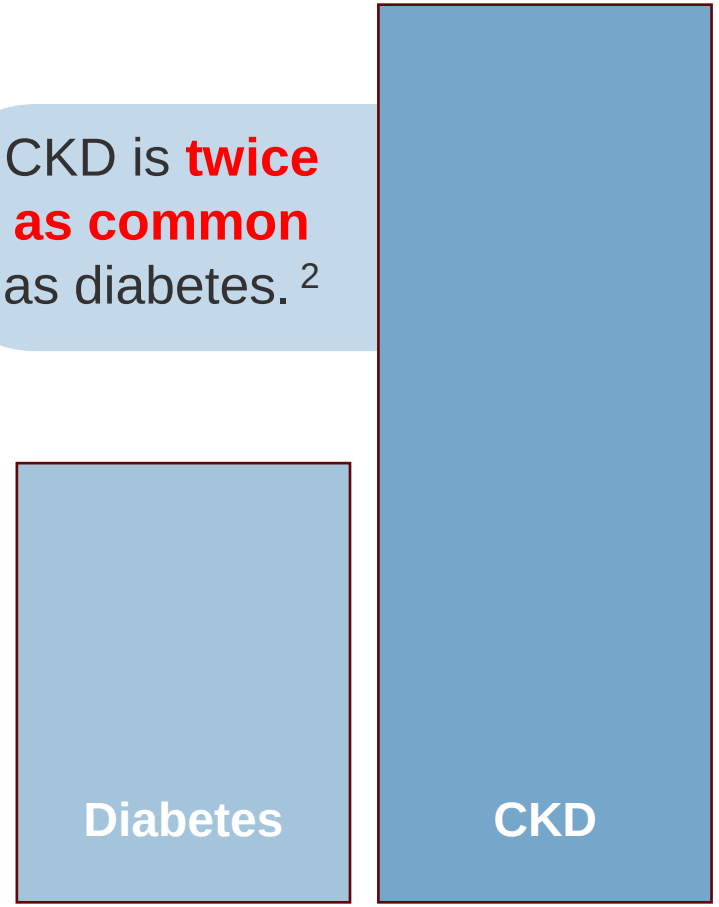
CKD in Australia - Common



Australian adults (1 in 10) aged 18 years and over have indicators of CKD such as reduced kidney function and/or albumin in the urine.[1]

Australian adults have at least one factor increasing their risk of CKD. [3]

CKD is **twice as common** as diabetes. [2]



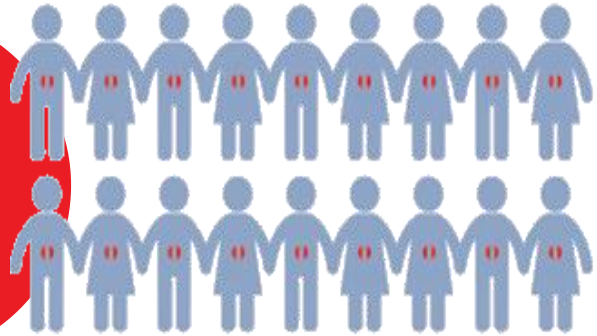
1. Deloitte Access Economics. *Changing the chronic kidney disease landscape: the economic benefits of early detection and treatment*. 2023:62. February 2023. Accessed January 23, 2024. https//kidney.org.au./get-involved/advocacy/deloittereport
2. Australian Bureau of Statistics. *Australian Health Survey: Biomedical Results for Chronic Diseases*, 2011-12. 2013.
3. Australian Institute of Health Welfare. Chronic kidney disease: *Australian facts*. 2023.

CKD in Australia - Harmful

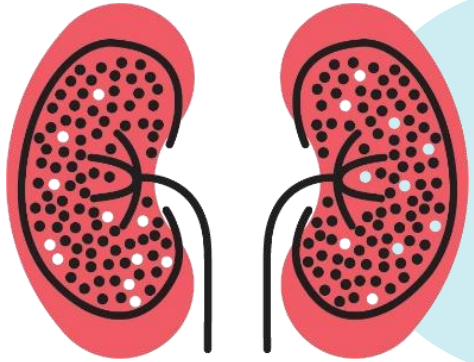
People with CKD are up to **20 times** more likely to **die from a heart attack** or stroke than they are to progress to kidney failure. [2]

~20,000

Australians **die every year** with kidney disease. [1]



The number of people needing treatment for kidney failure has **doubled** in the last 20 years. [1]



The **burden of CKD** is greatest in people experiencing socioeconomic disadvantage, living rurally and in First Nations Australians. [1]

1. Australian Institute of Health Welfare. Chronic kidney disease: *Australian facts*. 2023.
2. Tonelli M, Wiebe N, Culleton B, et al. Chronic kidney disease and mortality risk: systematic review. *J AM Soc Neph*. 2006;17:2034-2047.

CKD in Australia - Treatable

If CKD is **detected early** and managed appropriately, deterioration in kidney function can be **reduced by as much as 50%.** [1]

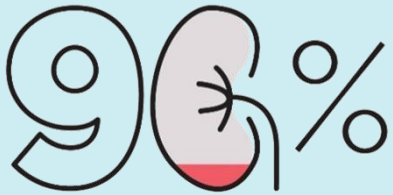
New treatments can slow the progression of CKD by up to **15 years**, or potentially longer if started early. [2]

1. Johnson DW. Evidence-based guide to slowing the progression of early renal insufficiency. *Intern Med J*. 2004;34(1-2):50-57.
2. Fernandez-Fernandez B. Sarafidis P, Soler MJ, Ortiz A. EMPA-KIDNEY: expanding the range of kidney protection by SGLT2 inhibitors. *Clin Kidney J*. Aug 2023;16(8):1187-1198. doi:10.1093/ckj/sfad082

CKD in Australia - Overlooked

< 10%

Fewer than 10% of people with CKD are aware they have this condition. [1]



90% of kidney function can be lost before people experience symptoms. [1]

17%

Late referral is common. 17% of people commence dialysis within 90 days of being referred to a kidney service. [2]

1. Australian Bureau of Statistics. *Australian Health Survey: Biomedical Results for Chronic Diseases*, 2011-12. 2013.
2. ANZDATA Registry. 46th Report, Chapter 1: Incidence of Kidney Failure with Replacement Therapy. 2023. Accessed December 04, 2023. https://www.anzdata.org.au/report/anzdata-46th-annual-report-2023-data-to-2022/

Combined, what percentage of Australian adults are affected by one or more of these conditions: CKD, Diabetes & CVD?

a) 12%

b) 29%

c) 53%

d) 66%

Question

Combined, what percentage of Australian adults are affected by one or more of these conditions: CKD, Diabetes & CVD?

b) 12%

c) 29%

d) 53%

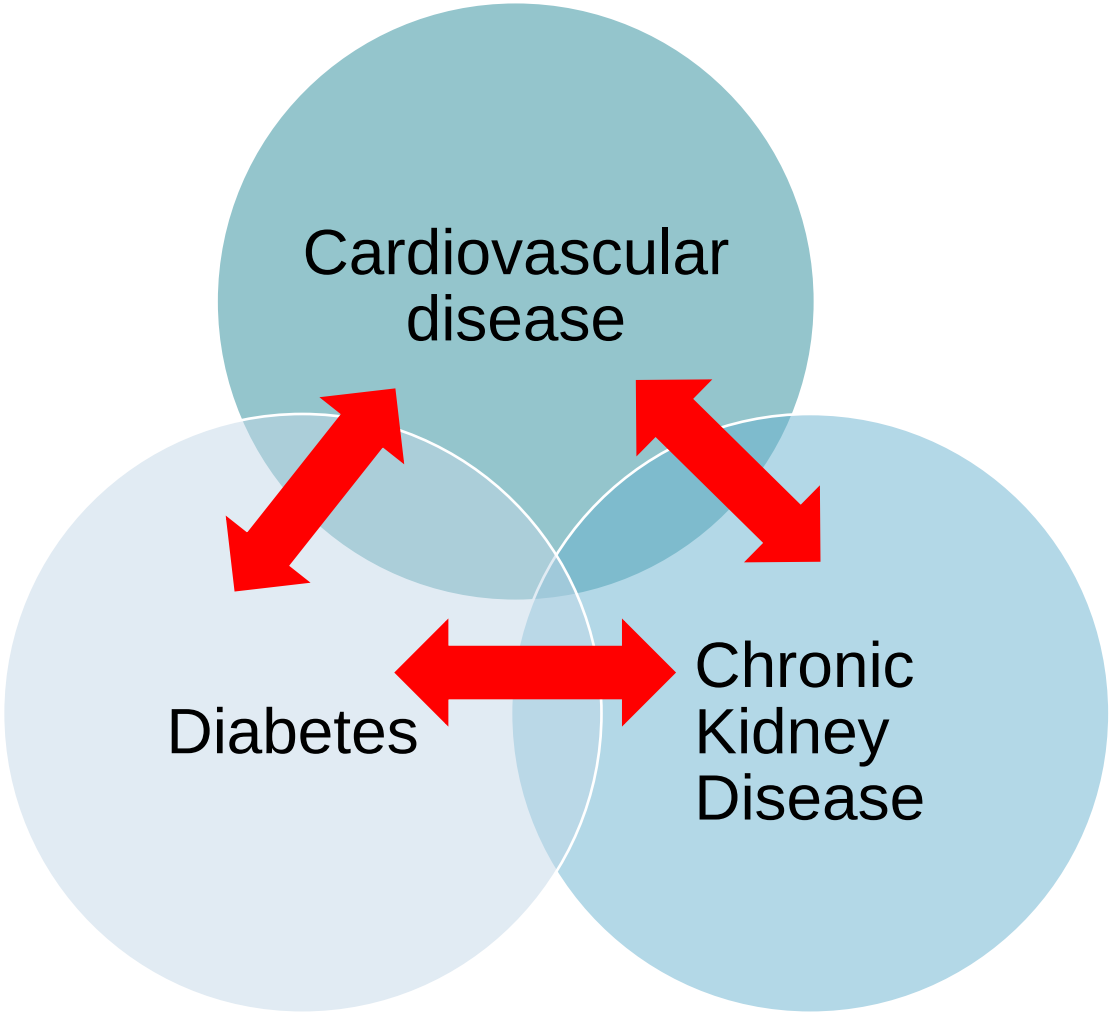
e) 66%

Answer

White SL. Chronic Kidney Disease, Diabetes & Cardiovascular Disease: Evidence Report 2021. Kidney Health Australia, Melbourne, Australia 2021

The link between CKD, Diabetes & CVD

- Shared risk factors, treatment goals and management
- Each affects the morbidity, mortality and outcomes and of the others
- Increased health and social burden results in greater healthcare utilisation and hospitalisations.



White SL. Chronic Kidney Disease, Diabetes & Cardiovascular Disease: Evidence Report 2021. Kidney Health Australia, Melbourne, Australia 2021

Case study – Dennis

Background

- 56 years old
- Divorced and lives on his own
- Runs a small business in landscaping supplies

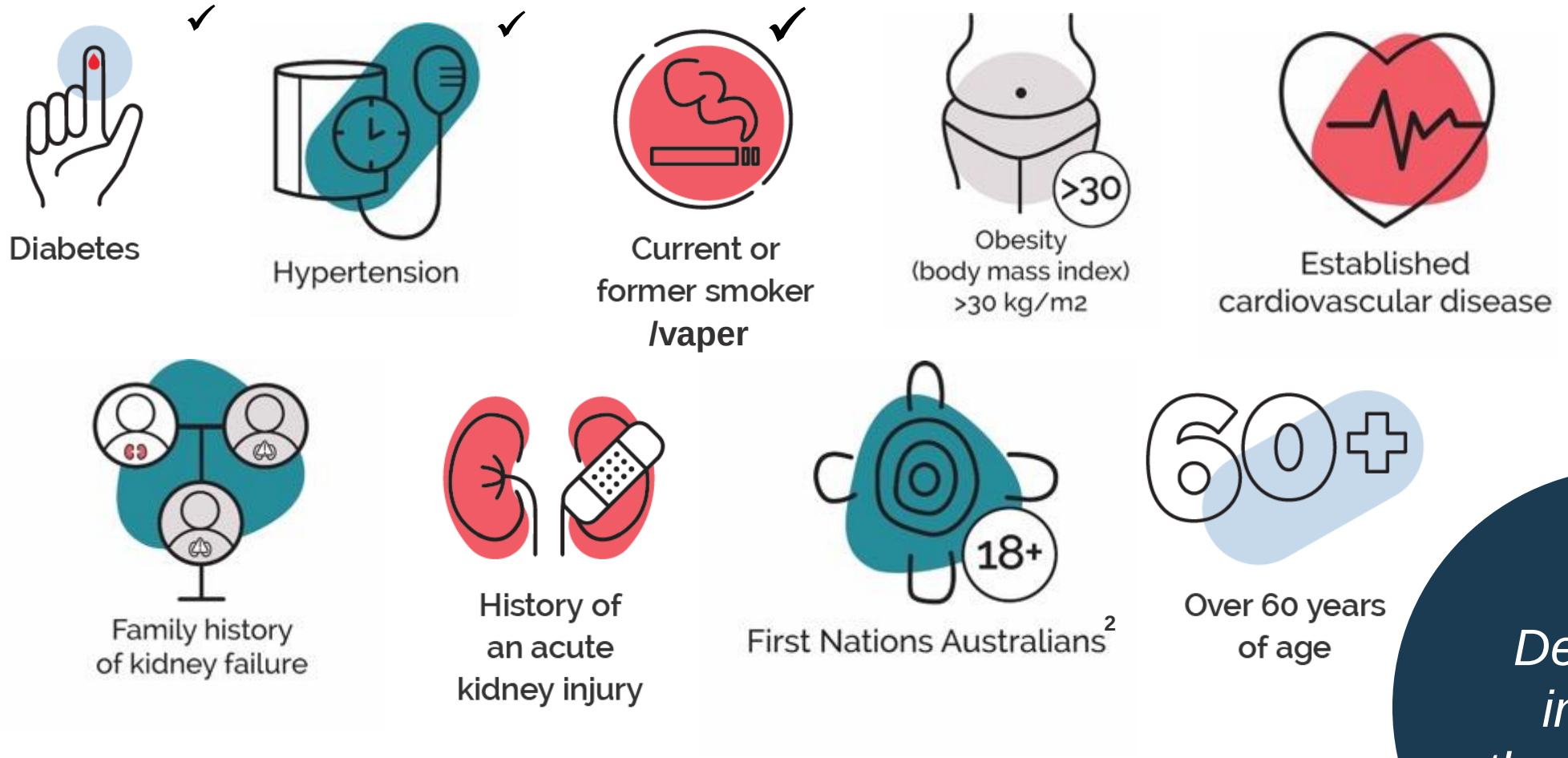
Today

- Dennis sees you, in your role as practice nurse, for a flu vaccination as part of his Care Plan.

History

Medical conditions:	**Hypertension, 18 years** **Dyslipidaemia, 6 months ago** **Diabetes, 3 years ago, diet controlled** **Knee osteoarthritis**
Previous smoker:	Cessation 8 years ago (25 pack-year history)
Alcohol:	3-5 drinks per week
Medications:	Candesartan 8 mg daily *(angiotensin-receptor blocker – ARB)*

Who should be offered a Kidney Health Check?



Dennis fits into 3 of these groups

1. Chronic Kidney Disease (CKD) Management in Primary Care, (5th edition). Kidney Health Australia: Melbourne, 2024
2. Recommendations for culturally safe kidney care for First Nations Australians. 2022

What are the elements of targeted assessment (Kidney Health Check) for CKD in at risk groups?

a) Serum creatinine and eGFR
b) Renal imaging
c) Blood pressure measure
d) Urine Protein:Creatinine Ratio (uPCR)
e) Urine dipstick
f) Urine Albumin:Creatinine Ratio (uACR)

Question

What are the elements of targeted assessment (Kidney Health Check) for CKD in at risk groups?

a) Serum Creatinine and eGFR

b) Kidney Imaging

c) Blood pressure measure

d) Urine Protein:Creatinine ratio (uPCR)

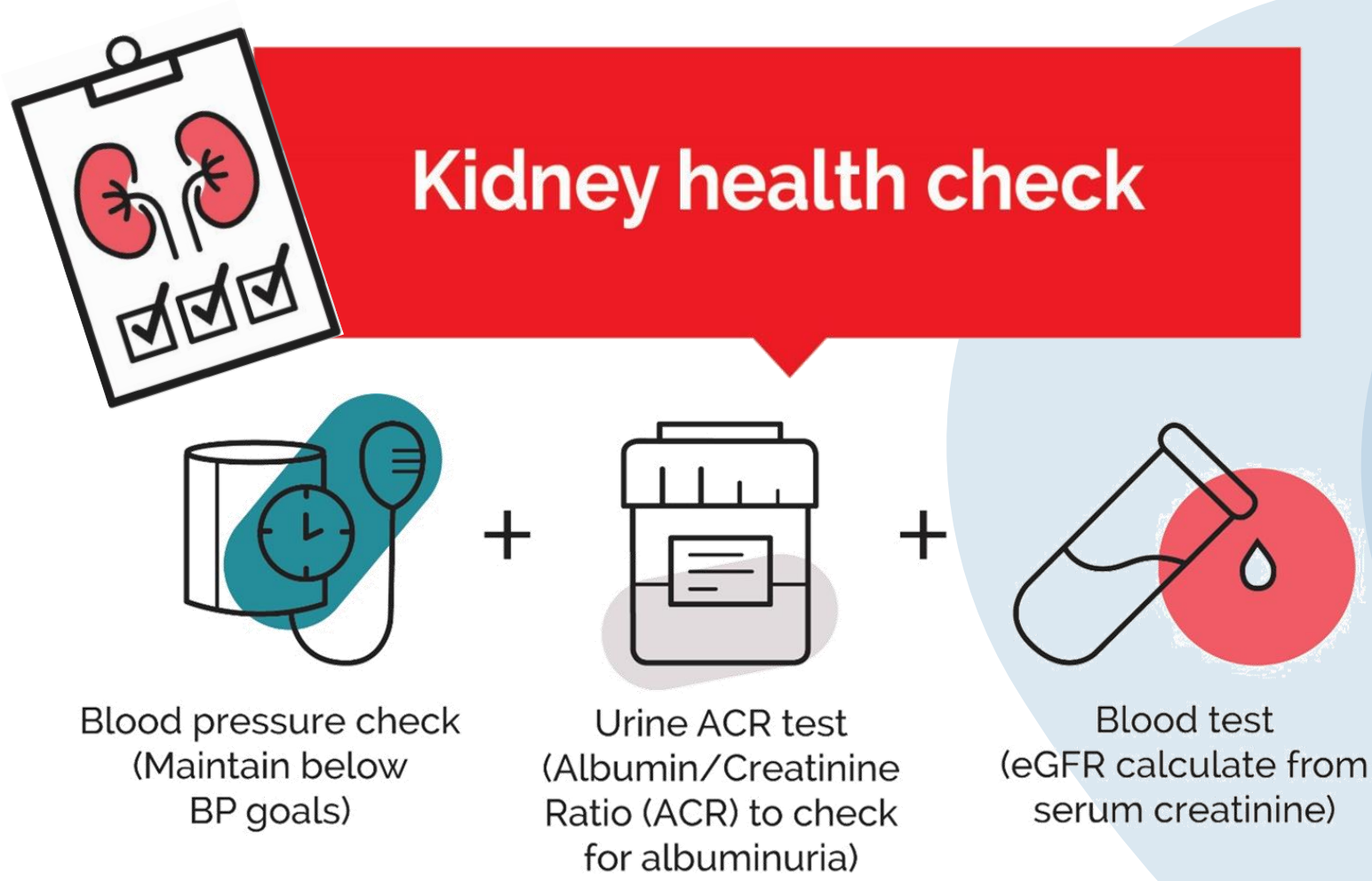
e) Urine dipstick

f) Urine Albumin:Creatinine Ratio (uACR)

Answer

How to detect CKD …

Add **Kidney Health Checks** to your care plan templates.



Complete a **Kidney Health Check** every 1-2* years

***annually for individuals living with diabetes or hypertension and First Nations Australians 18 years and over.**

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Early detection of CKD in non-Indigenous Australians

Indication for assessment	Recommended frequency	Assessment
Diabetes / Hypertension	Annually	Complete a **Kidney Health Check**: 1. Blood pressure check 2. uACR (first morning void preferably) 3. eGFR If results indicate CKD, repeat tests.
Established CVD Family history of kidney failure Obesity Smoking/vaping	Every 2 years	
History of acute kidney injury (AKI)	Every year for first 3 years post AKI, then every 2 years	
Aged ≥ 60 years	Once off, unless developing other indications for assessment	

Refer to the CKD Go! app or page 14 of the handbook

Chronic Kidney Disease (CKD) Management in Primary Care, 5th edition. Kidney Health Australia: Melbourne, 2024

Early detection of CKD in First Nations Australians

Indication for assessment	Recommended frequency	Assessment
Aged < 18 years	As needed.	Screen for 'red flags' of CKD: • Family history of CKD • Clinical history of diabetes, hypertension, obesity, smoking, established CVD, AKI, low birth weight or recurrent childhood infections Complete **Kidney Health Check** if concerned.
Aged ≥ 18 years	At least annually. Utilise MBS item 715, if appropriate.	Complete a **Kidney Health Check.**

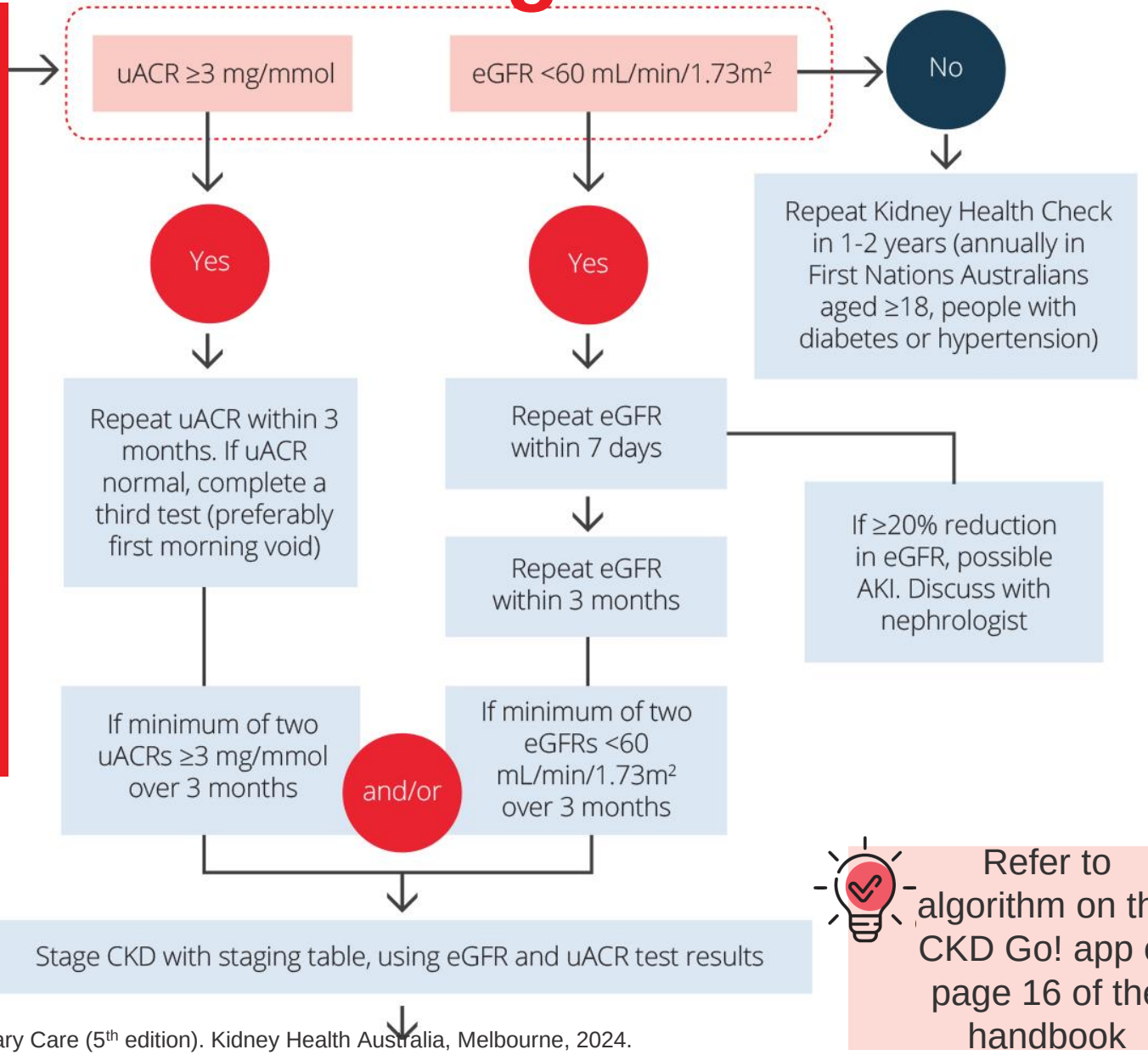
Refer to page 15 of the handbook

Chronic Kidney Disease (CKD) Management in Primary Care, 5th edition. Kidney Health Australia: Melbourne, 2024

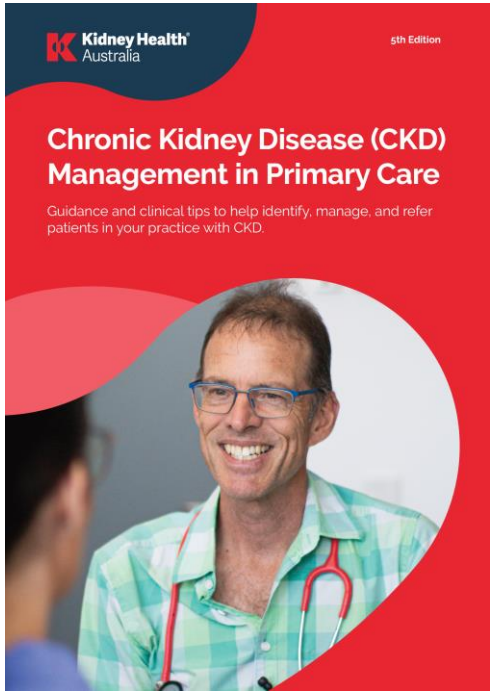
Initial detection and diagnosis of CKD

Offer a Kidney Health Check to people with

- Diabetes
- Hypertension
- Established CVD
- Family history of kidney failure
- Obesity (BMI ≥30)
- Current or former smoker or vaper
- History of acute kidney injury (AKI)
- First Nations Australians aged ≥18 years
- All Australians aged ≥60 years

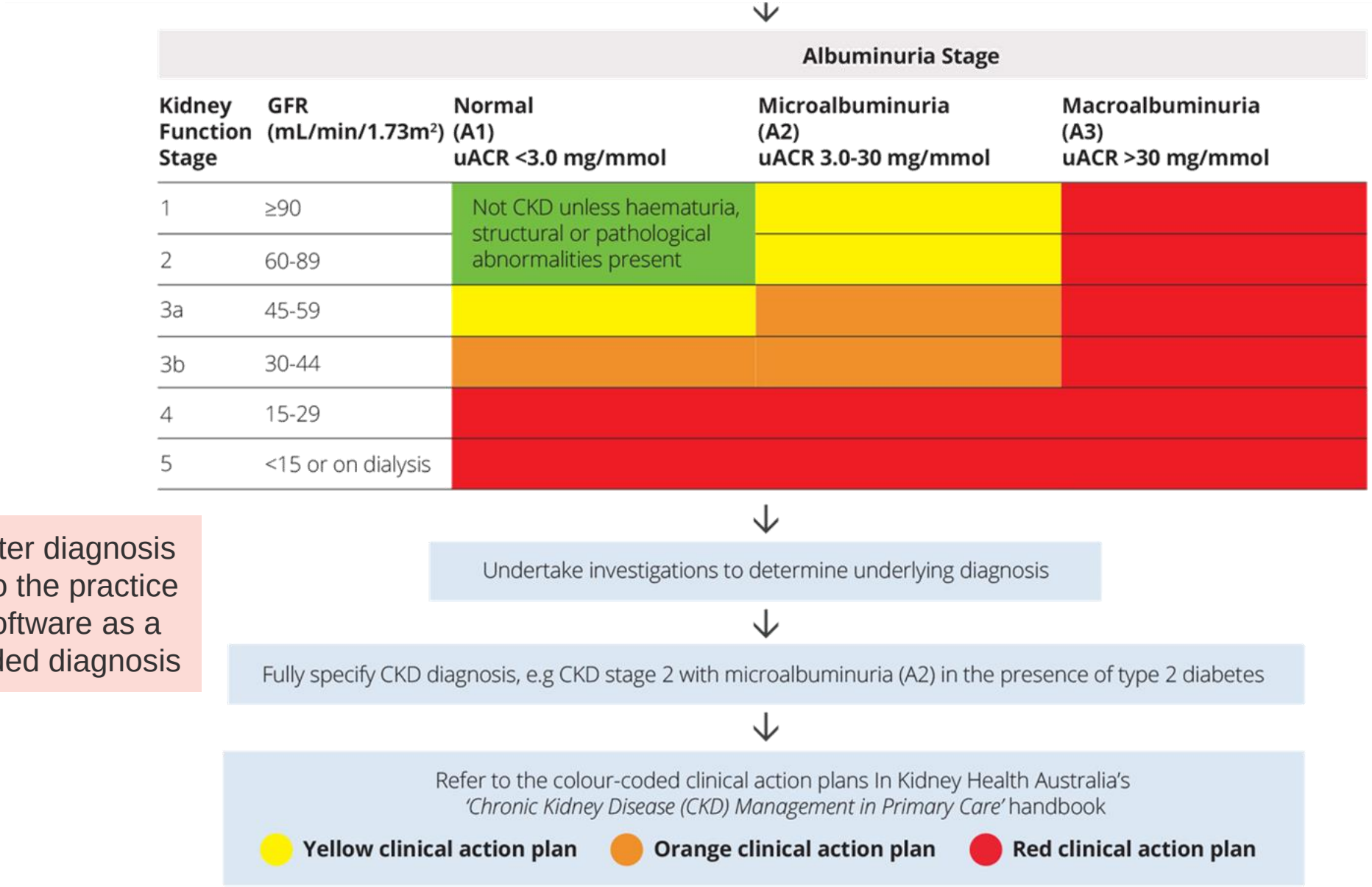


Refer to algorithm on the CKD Go! app or page 16 of the handbook



Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Algorithm for initial detection and diagnosis of CKD cont…

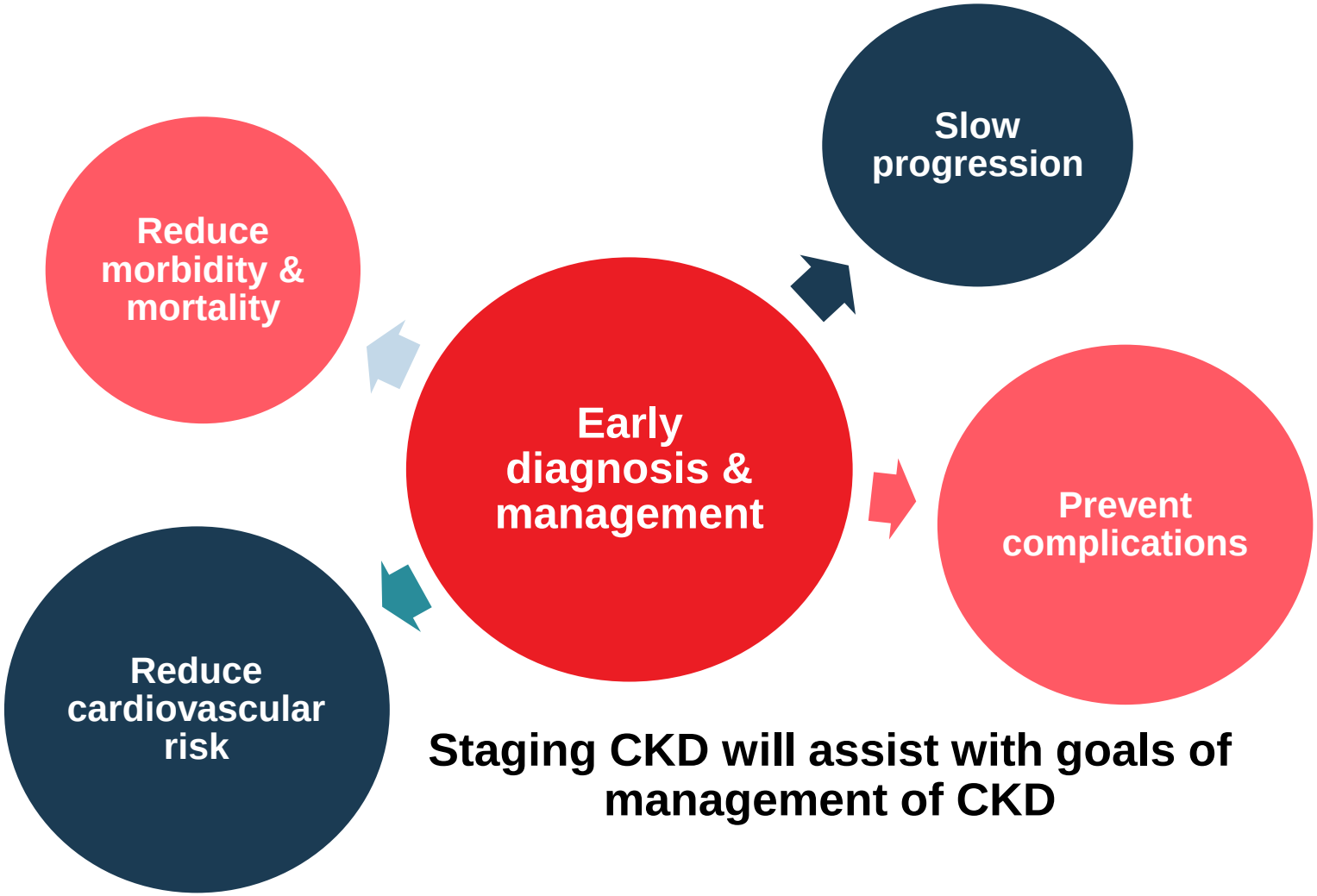


Enter diagnosis into the practice software as a coded diagnosis

Refer to algorithm on the CKD Go! app or page 16 of the handbook

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Significance of CKD staging



Staging CKD will assist with goals of management of CKD

*If **CKD is diagnosed early** and **managed appropriately**, **deterioration** in kidney function can be **reduced by as much as…***

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Collecting your practice data

Use a data analysis tool (e.g. POLAR, PenCAT or Primary Sense) to create reports to identify patients at risk of CKD and should be offered a Kidney Health Check.

Join the Hub!

‘How to guides’ available in the Kidney Health Professional Hub. Join today!
kidney.org.au/hphub

Case study - Dennis

Dennis' blood test results have arrived at the practice, while triaging results you notice his eGFR and uACR are abnormal.

Fasting bloods		Reference range
BGL	9.0 mmol/L / 8.0% HbA1c	< 3.6-6.0 mmol/L ≤ 5.6%
K^+	4.2 mmol/L	3.5 – 5.5 mmol/L
Creatinine	165 µmol/L	> 45-85 µmol/L
eGFR	**40mL/min/1.73m²**	**> 90 mL/min/1.73m²**
Total cholesterol	6.7 mmol/L	3.5 – 5.5 mmol/L
HDL cholesterol	1.4 mmol/L	> 1.0 mmol/L
LDL cholesterol	3.2 mmol/L	< 1.8 mmol/L
Triglycerides	2.4 mmol/L	< 1.5 mmol/L
Urine ACR (early morning)	**22.6 mg/mmol**	**< 3.0 mg/mmol**

Dennis' uACR is 22.6 mg/mmol and eGFR 40 mL/min/1.73m^2. Using the Algorithm for initial detection and diagnosis of CKD in the CKD Go! App, does he have CKD?

a) No
b) Yes

Question

Dennis' is uACR is 22.6 mg/mmol and eGFR 40 mL/min/1.73m^2. Using the Algorithm for initial detection and diagnosis of CKD in the CKD Go! App, does he have CKD?

a) No

b) Yes

Answer

Dennis' uACR is 22.6 mg/mmol and eGFR 40 mL/min/1.73m^2. Using the CKD Calculator in the CKD Go! App, which colour-coded Clinical Action plan should be followed, and incorporated into his care plan, to slow Dennis' progression of CKD?

a) Yellow clinical action plan
b) Orange clinical action plan
c) Red clinical action plan

Question

Dennis' uACR is 22.6 mg/mmol and eGFR 40 mL/min/1.73m^2. Using the CKD Calculator in the CKD Go! App, which colour-coded Clinical Action plan should be followed, and incorporated into his care plan, to slow Dennis' progression of CKD?

a) Yellow clinical action plan

b) Orange clinical action plan

c) Red clinical action plan

Answer

Colour-coded action plan

Enter review reminders and into practice software

Orange clinical action plan

eGFR 30-59mL/min/1.73m² with microalbuminuria (A2) or
eGFR 30-44 mL/min/1.73m² with normoalbuminuria (A1)

Management goals

- Slow progression of CKD.
  - Slow decline in eGFR.
  - Reduce albuminuria by at least 30%.
- Assess and lower cardiovascular risk.
- Avoid nephrotoxic medications or volume depletion.
- Encourage positive lifestyle changes and self-management practices.

+

- Early detection and management of complications.
- Adjust medication doses to levels appropriate for kidney function.
- Appropriate referral to a nephrologist when indicated.

+

Management strategies – as for Yellow action plan, plus…

Frequency of review

- Every 3-6 months

Clinical assessment

- Iron studies
- Calcium and phosphate
- Parathyroid hormone (6-12 monthly if eGFR < 45mL/min/1.73m^2)

Treatment checklist

- Assess for common issues presenting in CKD.
- Appropriate referral to a nephrologist when indicated.

Refer to action plans on pages 26-27 of the handbook

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

The presence of albuminuria is an important prognostic feature of CKD, and the driver of CVD.

a) True
b) False
c) Don’t know

Question

The presence of albuminuria is an important prognostic feature of CKD, and the driver of CVD.

a) True
b) False
c) Don’t know

Answer

Because…

Urine albumin/creatinine ratio (uACR)

- Protein in the urine is a key marker of kidney damage and linked to increased risk of progression to kidney failure and CVD.
- Reduction in uACR is reno-protective.

Importantly

Elevated uACR is a more common sign of CKD than a decreased eGFR and is often missed as part of a Kidney Health Check in practice.

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

How to detect albuminuria

- An initial uACR test should be repeated on a first void sample if the results are positive for albuminuria as urinary protein excretion follows a circadian pattern.
- Where first morning void not possible, random spot specimen for uACR is acceptable.
- Dipsticks for protein in the urine are now no longer recommended due to poor sensitivity and specificity.
- uPCR tests may miss microalbuminuria, resulting in false-negative results.
- 24-hour urine collection is not warranted to quantify proteinuria.
- uACR criteria for CKD is not applicable in pregnancy.

Don't let perfection get in the way of testing!
Random sampling is better than NOT AT ALL

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Repeating the urine ACR

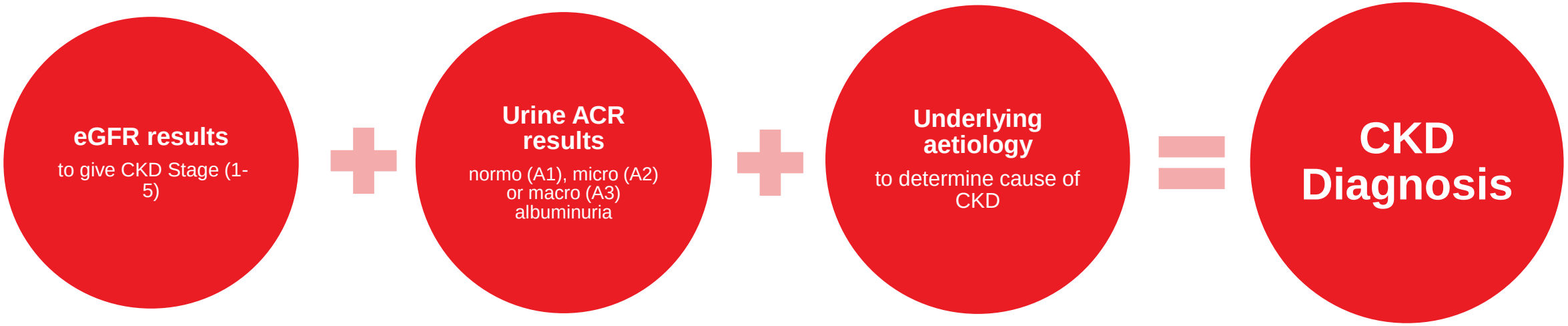
Factors other than CKD known to increase urine albumin excretion:

- Urinary tract infection
- High dietary protein intake
- Congestive heart failure
- Acute febrile illness
- Heavy exercise within 24 hours
- Menstruation
- Genital discharge or infection
- Drugs e.g. NSAIDS

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Diagnosing CKD

There are three components to a diagnosis of CKD



- eGFR gives the CKD stage. Consistent over 3 months
- Albuminuria is present if two of three tests over 3 months are ≥ 3.0 mg/mmol
- Underlying aetiology determines the cause of CKD

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

CKD, Diabetes & CVD are linked with interrelated biological pathways & risk factors

White SL. Chronic Kidney Disease, Diabetes & Cardiovascular Disease: Evidence Report 2021. Kidney Health Australia, Melbourne, Australia 2021

Nutrition and diet – lifestyle modification

Target	Detail
Healthy dietary pattern	• Vegetables, fruit, wholegrains, nuts and legumes, dairy foods, lean meat, poultry, fish and plant protein. • Associated with reduced risk of mortality, kidney failure, developing CKD, and progression of CKD • Can reduce rate of kidney function decline, decrease body weight and blood pressure, and metabolic acidosis.
Fluid	• Make water the drink of choice. • No recommended number of glasses to consume daily. • Drink to thirst. • Avoid sugar sweetened beverages – they have shown to elevate risk of and progression of CKD.
Salt	• Reduce intake to <5g per day
Ultra-processed foods	• Avoid foods high in fat, sugar and salt e.g. biscuits, cakes, packaged snack foods, takeaway foods, energy drinks, fruit juices and cordials.

Refer to the CKD Go! app or page 30 of the handbook

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Alcohol – lifestyle modification

- Australian guidelines recommend **healthy** men and women should drink no more than 10 standard drinks a week and no more than 4 standard drinks on any one day to reduce the risk of harm from alcohol-related disease or injury.

- There are no specific recommendations about safe levels of alcohol consumption people with CKD, however… the less you drink, the lower your risk of harm from alcohol.

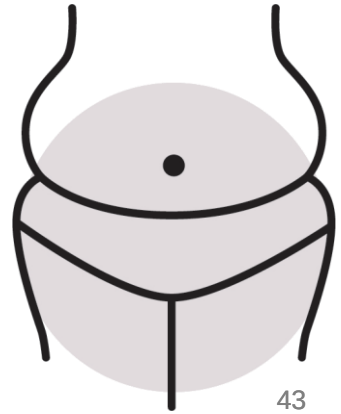
Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Weight management – lifestyle modification

Overweight (BMI 25.1-30) & obese (BMI >30) people are **40%** & **80%** more likely to develop CKD compared to normal weight individuals*

Although not as powerful as diabetes or hypertension, obese people are more likely to develop albuminuria and proteinuria

Central obesity more important than generalised obesity



*Wang Y et al. Association between obesity and kidney disease: a systematic review and meta-analysis. *Kidney Int*. 2008;73:19-33.

What are the key treatment interventions for Dennis now that he has been diagnosed with CKD
(choose multiple options)

a) **Lifestyle modification**
b) **Blood pressure management**
c) **Cardiovascular risk reduction**
d) **Lipid lowering treatment**
e) **Adjust medications to kidney function**
f) **Sick day action plan**
g) **Referral to nephrologist**
h) **Referral to the Kidney Helpline for non-medical advice for people living with CKD 1800 454 363**

Question

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

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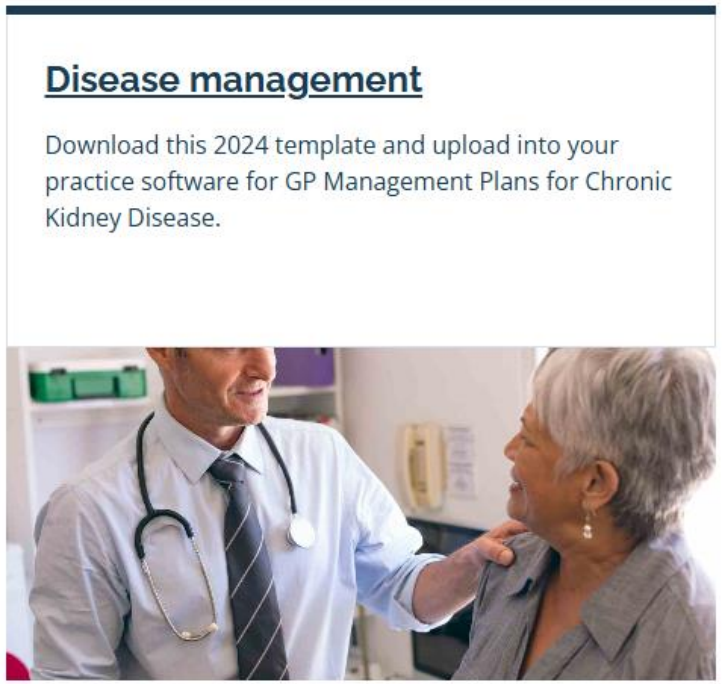
Answer

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Case study – Dennis

Dennis is eligible for a reclaim of his current GPMP.
CKD GPMP template is available in the Practice Toolkit on the Health Professional Hub



Sign up to the Kidney Health Professional Hub and download your copy of the CKD GPMP template today!

kidney.org.au/hphub

Or scan the QR code

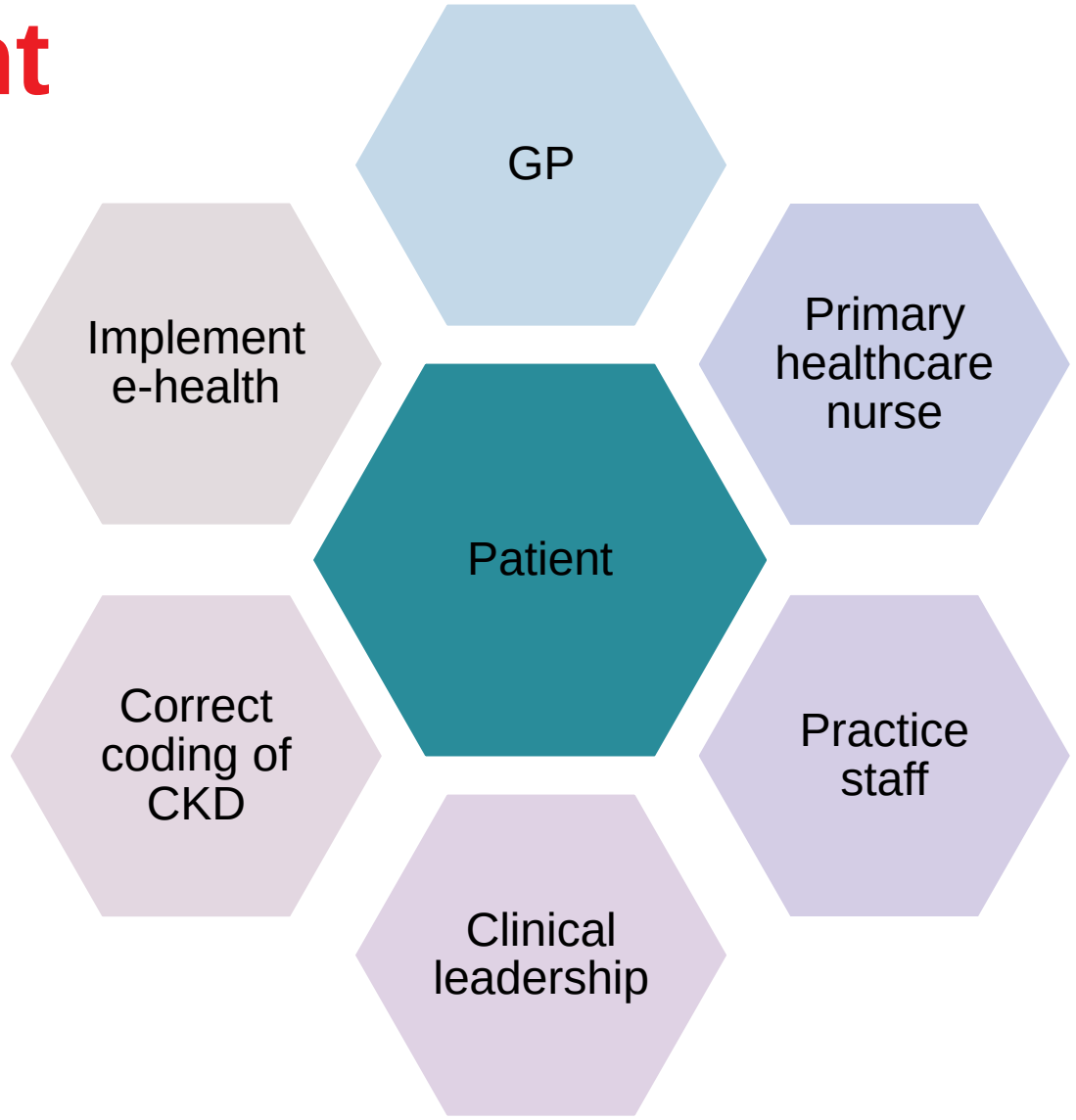
Join the Hub!

What other MBS item numbers could you use to assist with the detection and management of CKD?

Group discussion

Question

Whole of practice approach to CKD management



Adapted from Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

How do you establish Dennis' risk of experiencing a CVD event?

Question

a) Hypertension is his best indicator of a future CVD event.

b) Assess risk using the CVD risk tool in your practice software.

c) Assess risk using the online Australian CVD risk calculator.

d) Dennis has stage 3b CKD (30-44 mL/min/1.73m^{2,}) he is already at high risk *(refer to algorithm for initial detection and diagnosis of CKD, in the CKD Go! App, to identify CKD stage).*

How do you establish Dennis' risk of experiencing a CVD event?

a) His hypertension is the best indicator of a future CVD event.

b) Assess risk using the CVD risk tool in your practice software – *Note: some software CVD assessment tools not as accurate as the online Australian CVD risk calculator.*

c) Assess risk using the online Australian CVD risk calculator – more accurate than some practice software but not required in this scenario, because…

d) Dennis has stage 3b CKD (30-44 mL/min/1.73m^{2,}) he is already at high risk *(refer to algorithm for initial detection and diagnosis of CKD, in the CKD Go! App, to identify CKD stage).*

Answer

Cardiovascular risk assessment in CKD

CKD is a potent risk factor - more than diabetes.

↓eGFR + albuminuria are independent risks for CVD.

Australian CVD risk calculator can be used **but** determine CKD **before** using the calculator.

People with **eGFR < 45 mL/min/1.73m²** **and/or uACR > 30 mg/mmol** have **pre-determined high risk** of a CVD event in 5 years (≥ 10%).

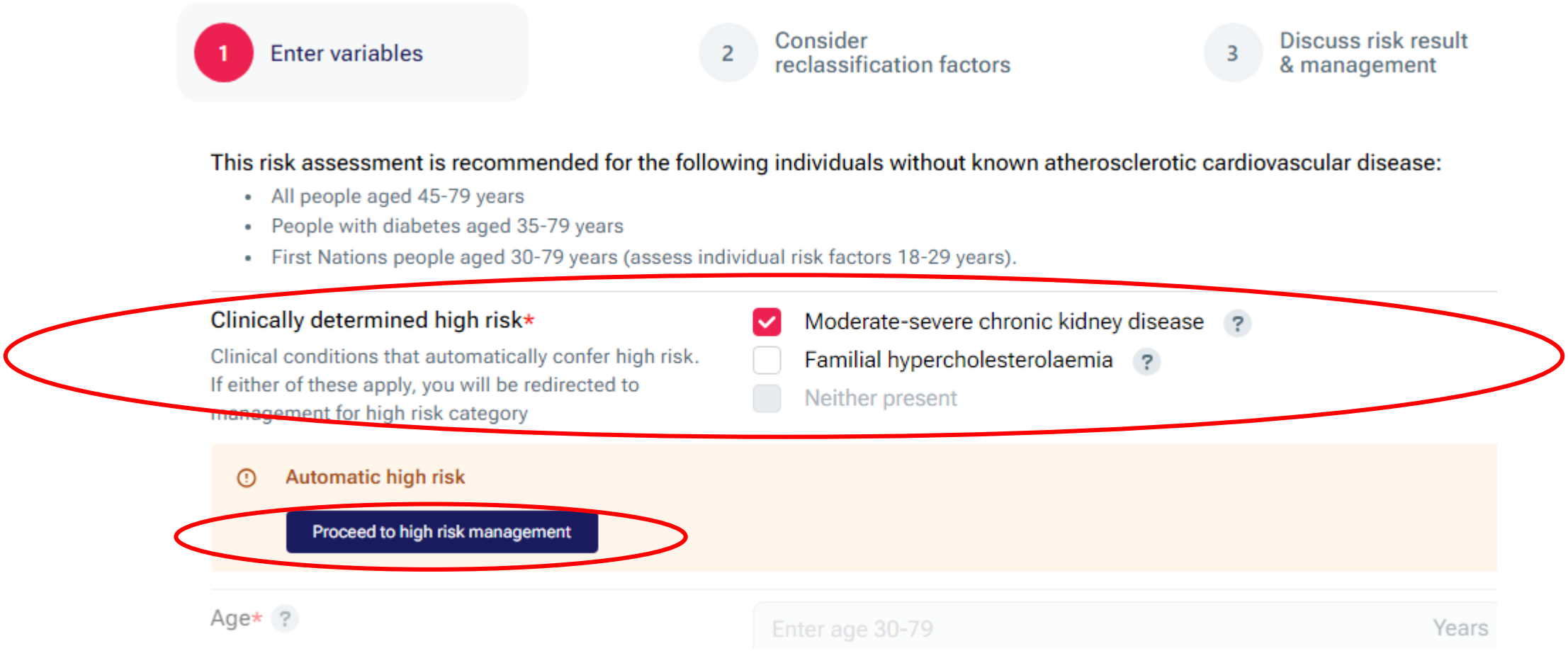
People with **eGFR 45-59 mL/min/1.73m²** and/or **3-30 mg/mmol**, **consider reclassification** to a higher risk category.

New CVD Guidelines July 2023
www.cvdcheck.org.au

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Australian CVD Risk Calculator

Dennis' eGFR is 40 mL/min/1.73m^2 therefore he is clinically determined high risk



Heart Foundation. Australian CVD Risk Calculator Updated July 2023. Accessed March 15, 2024. www.cvdcheck.org.au

Australian CVD Risk Calculator – cont…

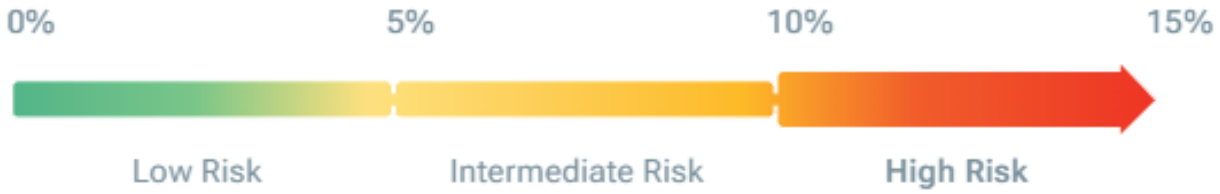
✓ Enter variables

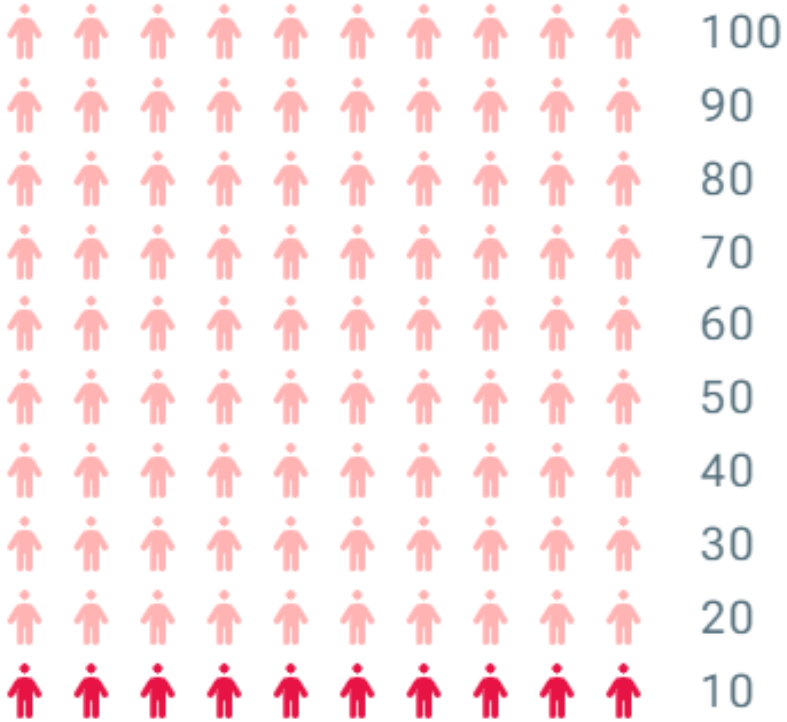
✓ Consider reclassification factors

3 Discuss risk result & management

High risk

Your current risk of having a heart attack or stroke in the next 5 years is estimated to be 10 out of 100 or higher, which is considered high. Imagine 100 people like you. 10 or more of those people will have a heart attack or stroke in the next 5 years if they don't take action.





Heart Foundation. Australian CVD Risk Calculator Updated July 2023. Accessed March 15, 2024. www.cvdcheck.org.au

CKD and hypertension

A bidirectional relationship

Hypertension is both a cause of CKD and a complication of CKD and can be difficult to control. The risks of uncontrolled hypertension include progression of kidney disease and increased risk of coronary heart disease and stroke.

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Dennis has hypertension.
What blood pressure target should he aim for?

a) 120/80
b) 130/80
c) 140/90
d) 110/60

Question

Dennis has hypertension.
What blood pressure target should he aim for?

a) 120/80
b) 130/80
c) 140/90
d) 110/60

Question

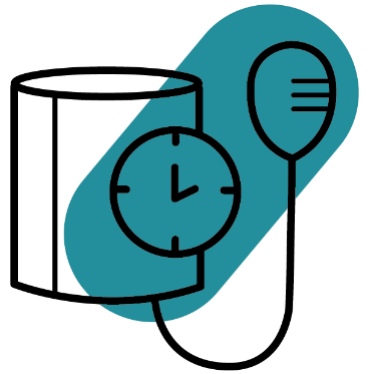
However, when might this target not be appropriate?
Discuss as a group.

Hypertension treatment targets

- Some evidence and clinical guidelines suggest aiming for a lower BP target (systolic BP <120mmHg) in people with CKD who with high CVD risk may improve outcomes.
- Lower BP targets need to be balanced with an increased risk of side effects including increased risk of falls due to hypotension, electrolyte abnormalities and episodes of AKI.

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Blood pressure reduction



ACE inhibitor **or** ARB is recommended first line therapy.

Reducing blood pressure to below target levels is one of the most important goals of CKD management

Lifestyle changes should always be advocated and can have significant effect on BP

Hypertension may be difficult to control, and multiple (3 or more) medications are frequently required

Refer to pages **52-56** in the CKD Handbook

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

PRESCRIBE: medications to slow CKD progression and reduce CVD risk

ACE inhibitor or ARB	Statin (+/- ezetimibe)	SGLT2 inhibitor*	Non-steroidal MRA*	GLP-1 RA*
• First-line treatment. • Up-titrate to maximum tolerated dose.	Consider use in: • People with CKD and a CVD risk ≥10% and • First Nations Australians with CKD and a CVD risk ≥5%.	• Use in people with CKD and proteinuria, with/without diabetes*. • **Do not initiate** if **eGFR <25mL/min/ 1.73m²).**	• Indicated for use in people with CKD (with albuminuria) associated with type 2 diabetes. • **Do not initiate** if **eGFR <25mL/min/ 1.73m²** or when **K+ >5.0mmol/L.**	• Indicated for use in people with CKD if they also have type 2 diabetes. • Do not use in people with kidney failure.

** Refer to product information for eligibility criteria and dosing*

Refer to pages **34-35** in the CKD Handbook

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

ACE inhibitor or ARB use in CKD

Refer to handbook pages **55**

- Can cause a reduction in eGFR when initiated
- Providing eGFR reduction is <25% within 2 weeks, continue
- If reduction >25%, stop and consider referral to a nephrologist
- Use caution if baseline K+ is ≥5.5 mmol/L as rises of ~0.5 are expected
- Combined ACE and ARB is not recommended

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Case study - Dennis

Dennis' GP prescribes an ACE inhibitor and metformin (titrated up to 1g bd). He sees you, the practice nurse, to discuss dietary changes and an exercise plan. Dennis returns for his follow up results.

Investigations	1st visit	1 month later
Fasting bloods		
BGL	9.0 mmol/L	7.0 mmol/L
	8.0% HbA1c	
K^+	4.2 mmol/L	4.2 mmol/L
Creatinine	165 µmol/L	183 µmol/L
eGFR	40 mL/min/1.73m^2	35 mL/min/1.73m^2
Total cholesterol	6.7 mmol/L	
HDL cholesterol	1.4 mmol/L	
LDL cholesterol	3.2 mmol/L	
Triglycerides	2.4 mmol/L	
Urine ACR (early morning)	22.6 mg/mmol	

You notice, Dennis' eGFR has dropped by 13%

SGLT2 inhibitors treatment for CKD

When can SGLT2 inhibitors be used in CKD?

PBS Criteria:

- Diagnosis of proteinuric CKD (with or without diabetes) present for ≥ 3 months prior to prescribing.
- eGFR 25 - 75 mL/min/1.73m^2
- uACR 22.6 - 565 mg/mmol
- Must be stabilised, for at least 4 weeks, on either: (i) an ACE inhibitor or (ii) an angiotensin II receptor antagonist.
- Do not use in combination with another SGLT2 inhibitor.
- Not recommended to initiate if eGFR < 25 mL/min/1.73m^2.
- May be prescribed by nurse practitioners (continuing therapy only)

Check pbs.gov.au for full prescribing criteria

Pharmaceutical Benefits Scheme (PBS) | Home

SGLT2 inhibitors

Clinical tip

- SGLT2 inhibitors cause a reversible drop in eGFR 4 weeks after initiation, then rebounds.
- Specific testing of eGFR for this purpose is not required.
- SGLT2 inhibitors cause osmotic diuresis, reduce diuretics and/or antihypertensive medications upon initiation of an SGLT2 inhibitor.

After starting an SGLT2 inhibitor, Dennis' eGFR decreases to 32 mL/min/1.73m^2 (creatinine 200µmol/L)

Should the medicine be stopped?

a) Yes

b) No

c) Maybe

Question

After starting an SGLT2 inhibitor, Dennis' eGFR decreases to 32 mL/min/1.73m^2 (creatinine 200µmol/L)

Should the medicine be stopped?

a) Yes

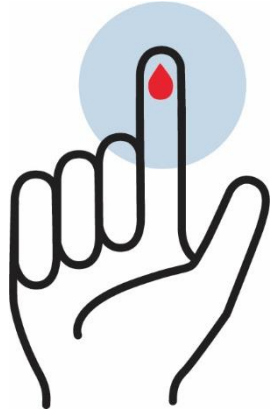
b) No

c) Maybe

Answer

Diabetic kidney disease and CKD therapy

Non-steroidal mineralocorticoid antagonist (nsMRA), finerenone, is PBS listed for diabetic kidney disease (DKD) to delay progressive decline of kidney function and reduce risk of CV event in addition to standard care.



Tips for using nsMRA

- PBS approved for use in diabetic kidney disease
- eGFR 25 - 75 mL/min/1.73m^2
- uACR 22.6 - 565 mg/mmol
- Add on therapy to both RAS (ACEi or ARB) and SGLT2 inhibitor
- Predictable drop in eGFR and rise in serum potassium - monitor carefully
- Do not use in combination with steroidal MRAs (e.g. spironolactone)

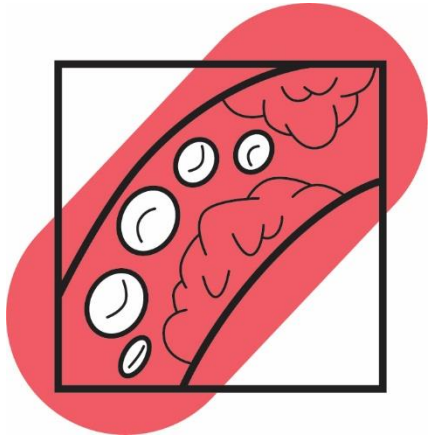
Bakris GL et al. *Effect of finerenone on chronic kidney disease outcomes in type 2 diabetes*. New Engl J Med. 2020;383(23): 2219-2229

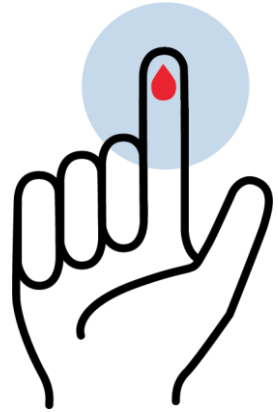
Case study - Dennis

Dennis' lipid levels are not at target…

Investigations	1st visit	2nd visit	3 months later
Fasting bloods			
BGL	9.0 mmol/L	7.0 mmol/L	
	8.0% HbA1c		7.4% HbA1c
K^+	4.2 mmol/L	4.3 mmol/L	4.9 mmol/L
Creatinine	165 µmol/L	183 µmol/L	170 µmol/L
eGFR	40 mL/min/1.73m^2	35 mL/min/1.73m^2	39 mL/min/1.73m^2
Total cholesterol	6.7 mmol/L		7.0 mmol/L
HDL cholesterol	1.4 mmol/L		1.0 mmol/L
LDL cholesterol	3.2 mmol/L		3.4 mmol/L
Triglycerides	2.4 mmol/L		2.6 mmol/L
Urine ACR (early morning)	22.6 mg/mmol		15.0 mg/mmol

Lipid lowering and glycaemic control





- **Lipids**
  - Dennis' lipids should be assessed
  - Lipid-lowering treatment should be considered for CVD risk reduction
- **Glycaemic control**
  - Dennis' glycaemic control should be assessed
  - For people with diabetes, blood glucose control significantly reduces the risk of developing CKD, and in those with CKD reduces the rate of progression

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Treatment targets for people with CKD - summary

Parameter	Target	Treatment
Blood pressure	≤ 130/80 mmHg	Lifestyle modification ACE inhibitor or ARB
Albuminuria	uACR reduction of at least 30%	ACE inhibitor or ARB
Lipids	No target lipid level is recommended	Dietary advice Statins
Blood glucose (for people with diabetes)	HbA1c ≤ 7.0% / ≤ 53 mmol/mol BGL 6-8 mmol/L (fasting) / 8-10 mmol/L (postprandial)	Lifestyle modification Oral hypoglycaemic Insulin SGLT2 inhibitor and nsMRA

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

REDUCE: medications excreted by the kidneys

Medications that may need to be started at a reduced dose or ceased in patients with CKD include but not limited to#:

Anti-infective	Cardiovascular	Diabetes	Pain	Other
• famciclovir • nirmatrelvir • valaciclovir • antibiotics e.g. ciprofloxacin, trimethoprim, sulfamethoxazole, aminoglycosides, nitrofurantoin	• apixaban • dabigatran • digoxin • rivaroxaban • sotalol • spironolactone	• acarbose • all gliptins except linogliptin • insulin • metformin* • sulfonylureas	• gabapentin • opioid analgesics • pregabalin	• allopurinol • benzodiazepines • colchicine • baclofen • duloxetine • escitalopram • solifenacin • fenofibrate • denosumab^ • lithium

* Metformin reduce dose if eGFR 30-60mL/min/1.73m^2 and under specialist supervision if eGFR<30mL/min/1.73m^2

^ While dose of reduction of denosumab is not required in CKD, the risk of hypocalcaemia increases with more advanced CKD

Refer to pages **34-35** in the CKD Handbook

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

AVOID: nephrotoxic medications

Commonly prescribed drugs that can adversely affect kidney function in CKD	Commonly prescribed drugs that should be avoided temporarily during a sick day (SADMANS)*
• Lithium • Aminoglycosides • NSAIDs/COX-2 inhibitors – beware of the 'triple whammy'	• **S**ulfonylureas • **A**CE inhibitors • **D**iuretics • **M**etformin • **A**RBs • **N**SAIDs • **S**GLT2 inhibitors

** It is important you discuss and create a Sick Day Action plan with patients with CKD that includes which medications to temporarily stop during periods of illness.*

Refer to pages **34-35** in the CKD Handbook

GPs and pharmacists need to discuss appropriate pain relief medication with patients

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Diabetic kidney disease medications

Medication Class	CKD Dosing	Comments
Metformin	• Reduce dose eGFR 45-60 mL/min/1.73m^2 • Not advised eGFR < 30 mL/min/1.73m^2	• Temporarily stop during periods of illness according to a Sick Day Action Plan.
SGLT2 inhibitors	Not recommended • Dapagliflozin eGFR < 25 mL/min/1.73m^2 • Empagliflozin eGFR < 20 mL/min/1.73m^2 *(variations occur between brands, check PBS before prescribing).*	• Recent evidence shows significant kidney and cardiovascular benefits for SGLT2 inhibitors (CREDENCE, DAPA-CKD, EMP-KIDNEY studies). • Possible side effects of genital mycotic infection and eDKA. • Temporarily stop during periods of illness.
Gliptins (DPP4-inhibitors)	• Not recommended • Saxagliptin and vildagliptin eGFR < 15 mL/min/1.73m^2 • No dose adjustment for linagliptin	• Not suitable for people with history of pancreatitis. • Risk of hypoglycaemia increased if prescribed with sulphonylureas.

Refer to pages **50-51** in the CKD Handbook

Chronic Kidney Disease (CKD) Management in Primary Care, 5th edition. Kidney Health Australia: Melbourne, 2024

Diabetic kidney disease medications – cont…

Medication Class	CKD Dosing	Comments
Sulfonylureas	• Dose reduction required at eGFR < 30 mL/min/1.73m^2	• Hypoglycaemia risk increases as eGFR declines. • Temporarily stop during periods of illness.
GLP-1 receptor agonist	• Not recommended semaglutide and dulaglutide (eGFR <15 mL/min/1.73m^2)	• Potential cardiovascular benefits
Insulin	• Doses titrated to blood sugar level	• As eGFR declines risk of hypoglycemia increases. • Temporarily stop during periods of illness.
nsMRA	• Not recommended • Finerenone < 25 mL/min/1.73m^2	• Indicated for diabetic kidney disease. • Cease when serum K^+ > 5.5 mmol/L.

Refer to pages **50-51** in the CKD Handbook

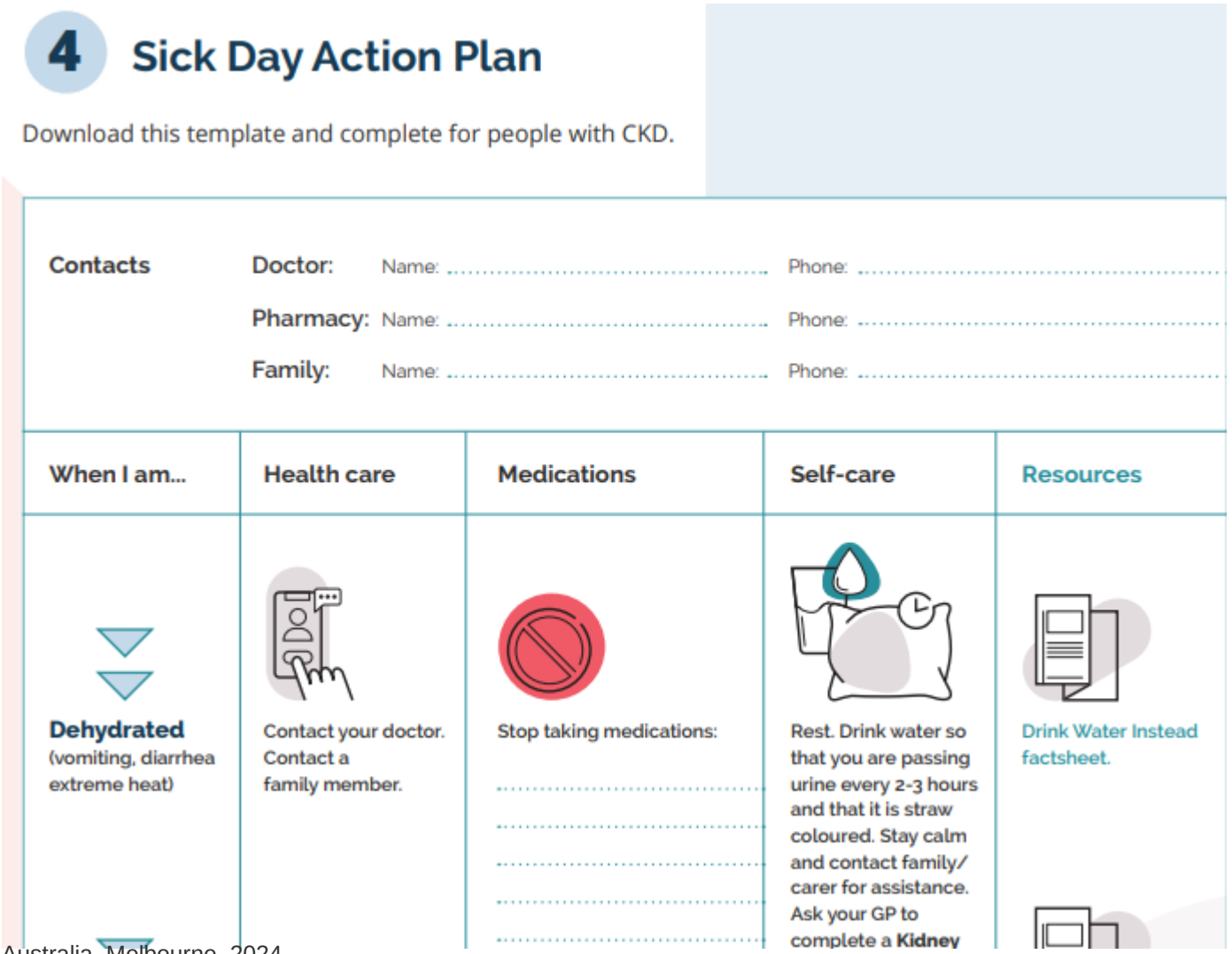
Chronic Kidney Disease (CKD) Management in Primary Care, 5th edition. Kidney Health Australia: Melbourne, 2024

Sick day action plan

Another important element to add to Dennis' CKD care plan is a Sick Day Action Plan

- ✓ All people with CKD stage 3-5 are at increased risk of AKI.
- ✓ Avoid NSAIDS and other nephrotoxic medications
- ✓ Early identification of people with acute illness (e.g. GI upset or dehydration)
- ✓ Temporarily cease ACE inhibitors, ARBs, diuretics with hypovolaemia / hypotension

Sick Day Action Plan template available in the Kidney Health Professional Hub. Join today!



4 Sick Day Action Plan

Download this template and complete for people with CKD.

Contacts			
	Doctor:	Name:	Phone: .....
	Pharmacy:	Name:	Phone: .....
	Family:	Name:	Phone: .....

When I am...	Health care	Medications	Self-care	Resources
Dehydrated (vomiting, diarrhea extreme heat)	Contact your doctor. Contact a family member.	Stop taking medications:	Rest. Drink water so that you are passing urine every 2-3 hours and that it is straw coloured. Stay calm and contact family/ carer for assistance. Ask your GP to complete a **Kidney**	Drink Water Instead factsheet.

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Sick day action plan

REMEMBER
Ensure patients/clients have a sick day action plan to prevent acute kidney injury (AKI).

Mnemonic for drugs to be avoided on a sick day (SADMANS)

Mnemonic for drugs to be avoided on a sick day (SADMANS)

- **S** Sulfonylureas
- **A** ACE-inhibitors
- **D** Diuretics
- **M** Metformin
- **A** Angiotensin receptor blockers
- **N** Non-steroidal anti-inflammatory
- **S** SGLT2 inhibitors

‘How to guides’ available in the Kidney Health Professional Hub

Chronic Kidney Disease (CKD) Management in Primary Care, 5th edition. Kidney Health Australia: Melbourne, 2024.

Considerations in older people

- Over 40% of people aged 75 years and over are affected by CKD.
- Individual approach required to address comorbidities, variability in functional status, life expectancy and health priorities.
- Relying on creatinine alone causes under-recognition of CKD.
- eGFR adjusted for age improves diagnostic accuracy.
- Treatment choice has more effect on lifestyle than it does on mortality or morbidity.
- Dialysis therapy may not offer survival advantage compared with non-dialysis comprehensive conservative care in elderly people with two or more comorbidities.

Chronic Kidney Disease (CKD) Management in Primary Care (5th edition). Kidney Health Australia, Melbourne, 2024.

Take home messages

- ✓ CKD, diabetes and CVD share the same risk factors, treatment goals and management.
- ✓ Actively identify people at risk of CKD using practice data and code in your practice software.

- ✓ Implement Kidney Health Check (blood test, uACR and BP) reminders for people at risk of CKD.
- ✓ Implement Kidney Health Check prompts in all chronic disease management templates.

Apply to your practice:

- ✓Algorithm for the initial detection
- ✓Colour coded clinical action plans to guide CKD management
- ✓PRESCRIBE, REDUCE AND AVOID classification of medications
- ✓Sick Day Action Plans

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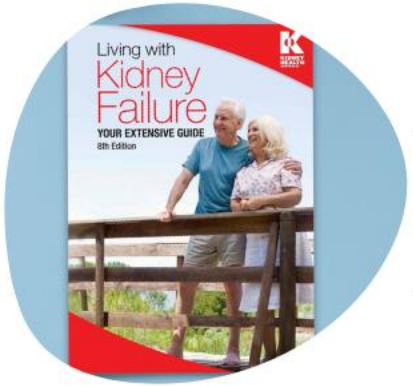
Kidney Health Resources

Treatment options series

Make informed choices about kidney disease treatment options. The series of **'An Introduction to'** booklets includes topics on: Treatment Options, Haemodialysis, Peritoneal Dialysis, Comprehensive Conservative Care, Kidney Transplantation, Kidney Donation by Living Donors, and Withdrawing from Dialysis.



Living with kidney failure
A practical guide providing a wealth of information about kidney disease, written in Australia, for Australians.

First Nations Peoples
Various factsheets, kidney stories toolkit, and flipchart for clinics available to download.

Download resources

SCAN ME

Eating Out Guide
General advice about good food choices, options, and substitutes when eating out.

Back on the Menu
Easy to follow recipes for a reduced potassium diet.

Dining In
Delicious recipes developed for people with kidney disease.

Thank you

Thank you for participating in this activity!

1. **Complete the evaluation** survey via this QR Code or on the case study handout.
2. **Download** your copy of the CKD Management in Primary Care 5th edition handbook www.kidney.org.au
3. **Follow Kidney Health Australia** on Facebook, LinkedIn and X