

Management of Stage 3 Chronic Kidney Disease in General Practice



Primary Care Education Workshop
*This module was conceived and developed by PEAK**

Presented By: Dr Sharad Ratanjee



Collaborators

***This Education was conceived and developed by the 'Primary Care Education Advisory Committee for KHA' (PEAK)**

With special thanks to Dr Paul Snelling

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Boehringer
Ingelheim

Speaker Disclosure Statement

- Kidney Health Australia Primary Care Workshops are presented by volunteer speakers (Nephrologists, Renal Nurses & other Health Professionals).
- *Speaker disclosure:*

Learning outcomes

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

Demonstrate the ability to stage chronic kidney disease (CKD) through accurate interpretation of kidney function

Define the goals for best practice management of CKD, particularly Stage 3

Determine when to refer patients with CKD to a Nephrologist according to the recommended clinical indicators

Implement a practice-based system, for patient safety, to identify patients at higher risk of CKD for a kidney health check

What is CKD?

Chronic kidney disease is defined as:

Glomerular Filtration Rate (GFR) < 60 mL/min/1.73m² for ≥3 months with or without evidence of kidney damage.

OR

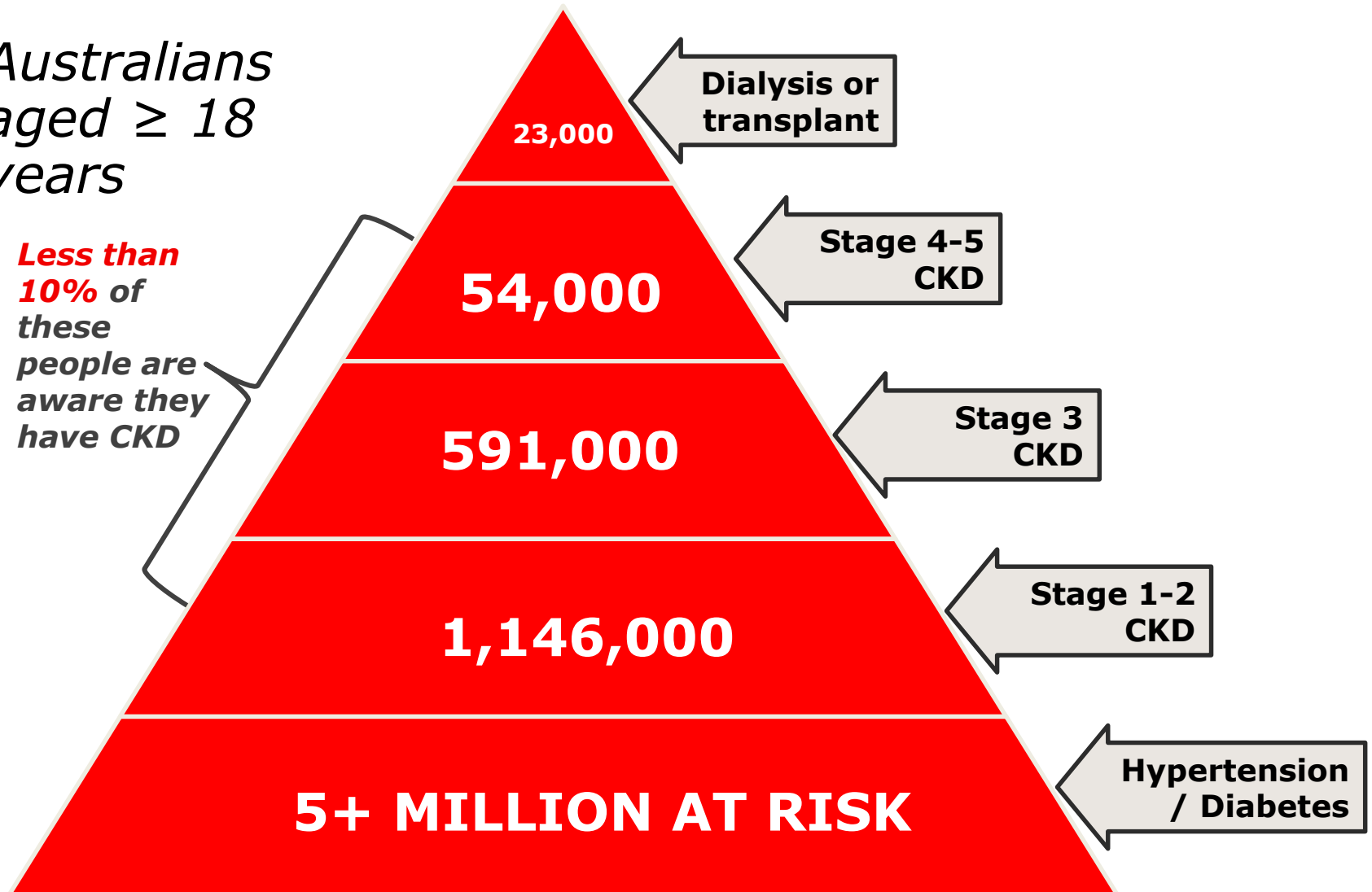
Evidence of kidney damage (with or without decreased GFR) for ≥3 months:

- albuminuria
- haematuria after exclusion of urological causes
- pathological abnormalities
- anatomical abnormalities

Kidney disease in Australia

*Australians
aged ≥ 18
years*

*Less than
10% of
these
people are
aware they
have CKD*



Australians living with signs of CKD



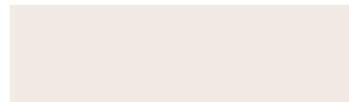
$\geq 12\%$ of population with signs of CKD



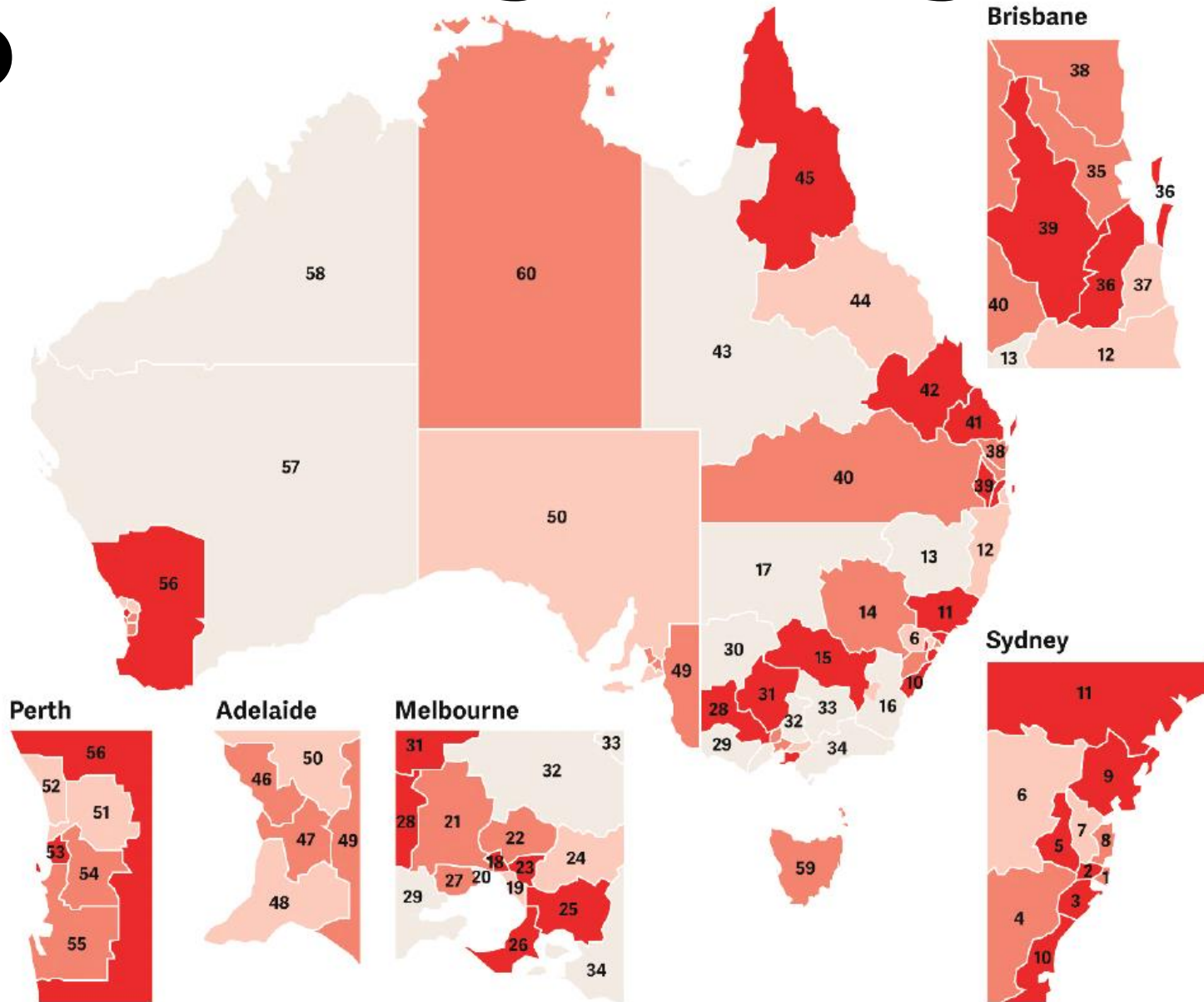
8-11% of population with signs of CKD



$\leq 7\%$ of population with signs of CKD



No data available



State of the Nation

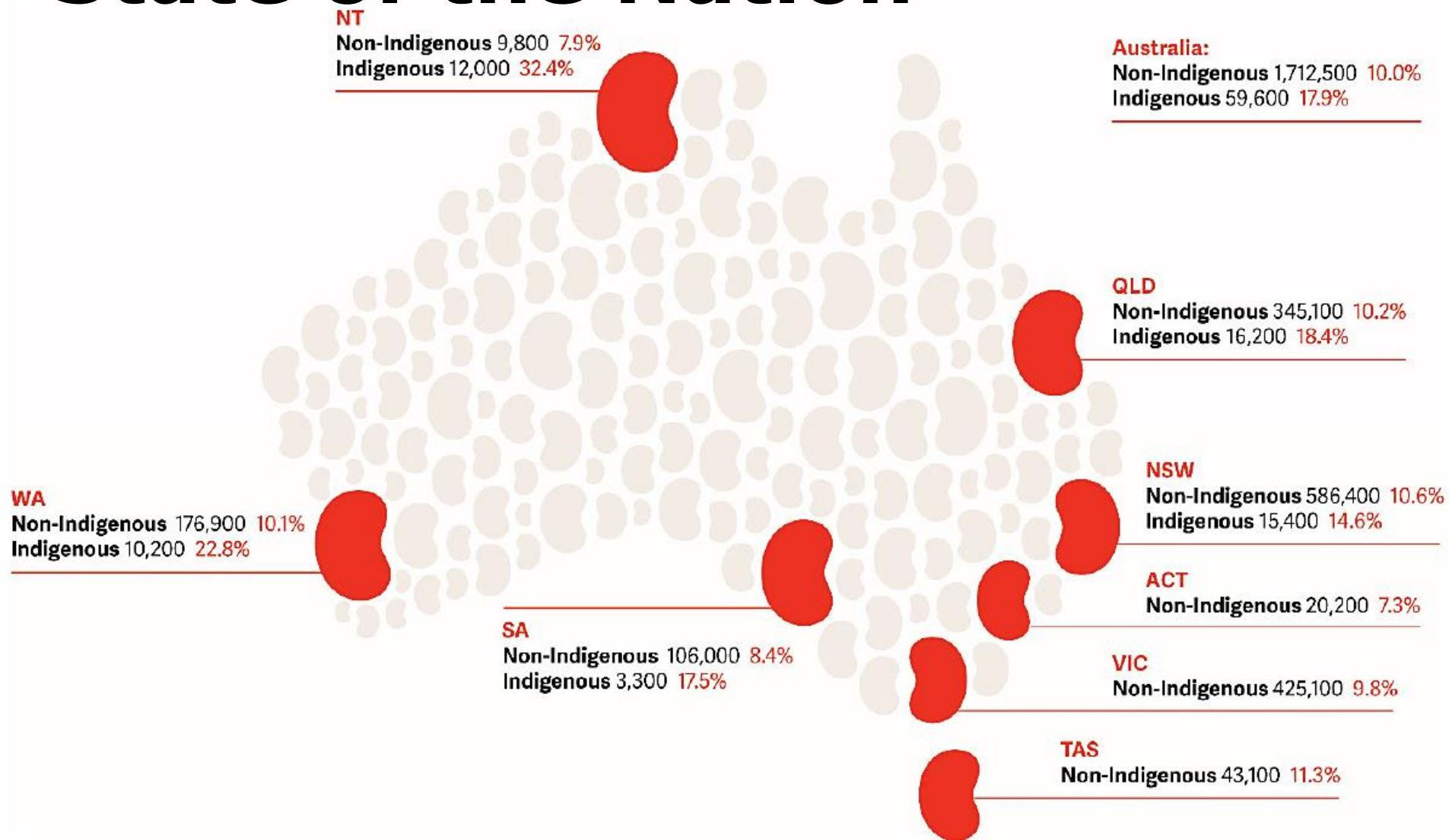


Figure 5. Living with signs of CKD – Number of people (proportion of population)⁸

Staging CKD

Combine **eGFR** stage, **albuminuria** stage and **underlying diagnosis** to specify CKD stage e.g. stage 3b CKD with microalbuminuria secondary to diabetic kidney disease

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

Colour-coded Clinical Action Plans in handbook
and on CKD-Go! App



ACTION PLANS

Below are the Clinical Action Plans for the three stages of Chronic Kidney Disease (measured using eGFR and urine ACR) compiled from Kidney Health Australia Guidelines. They are categorised yellow, orange and red indicating the overall risk of progression of CKD and cardiovascular events.

MORE RISK << >> **LESS RISK**

YELLOW >

ORANGE >

RED >

Chronic Kidney Disease (CKD) Management in General Practice

Guidance and clinical tips to help identify, manage and refer patients with CKD in your practice

Present, Detect, Support. **KCAT**

Staging CKD

'CKD management in General Practice' handbook uses colour-coded action plans indicating the overall risk of

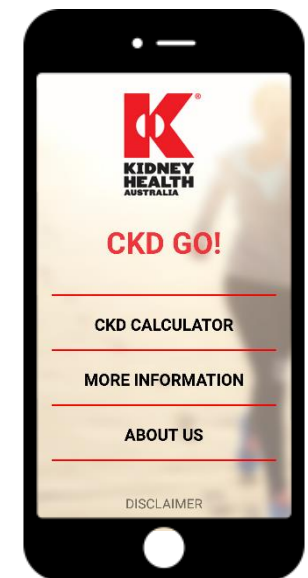
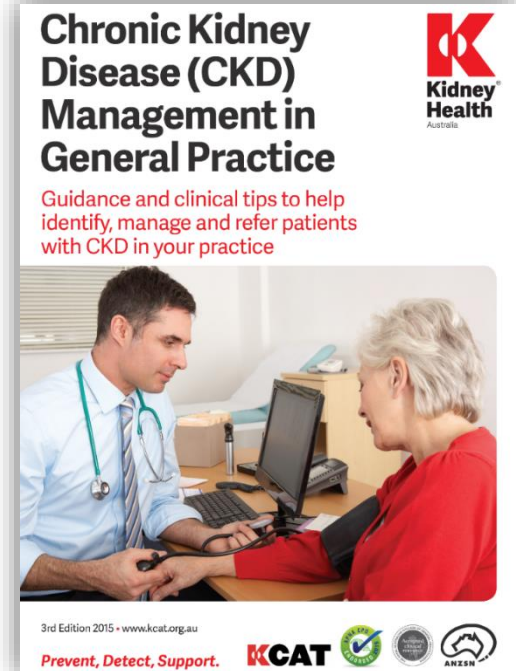
- Progression of CKD
- Cardiovascular events

Normal

Low

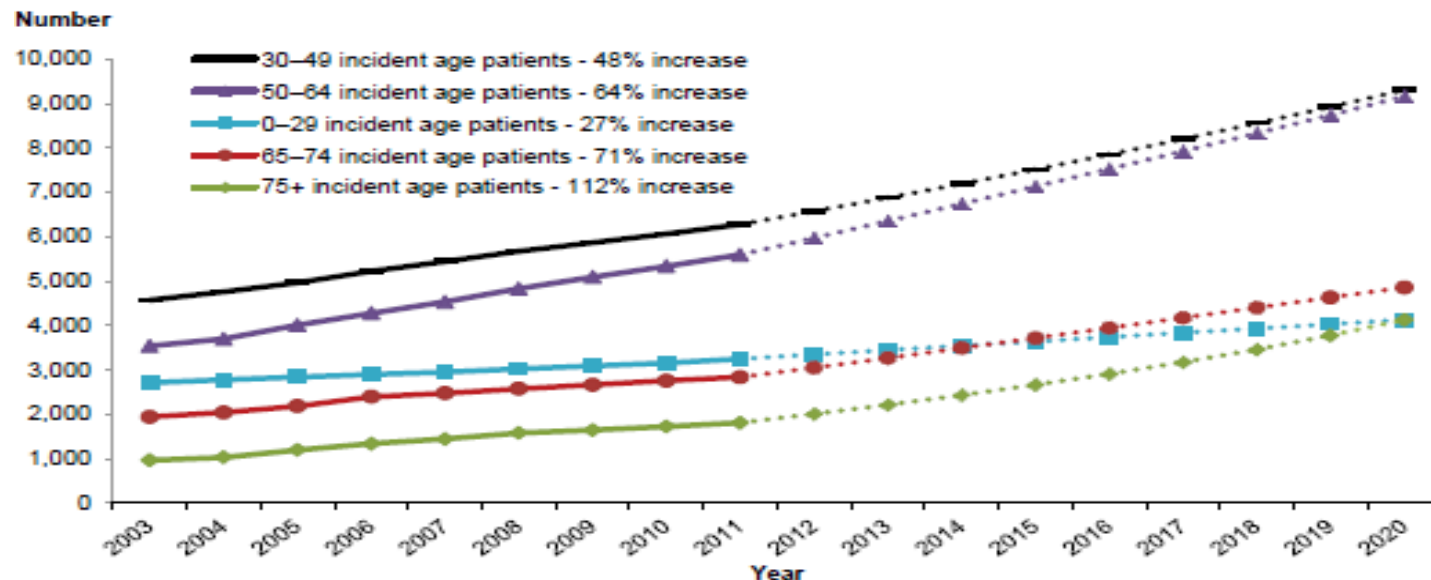
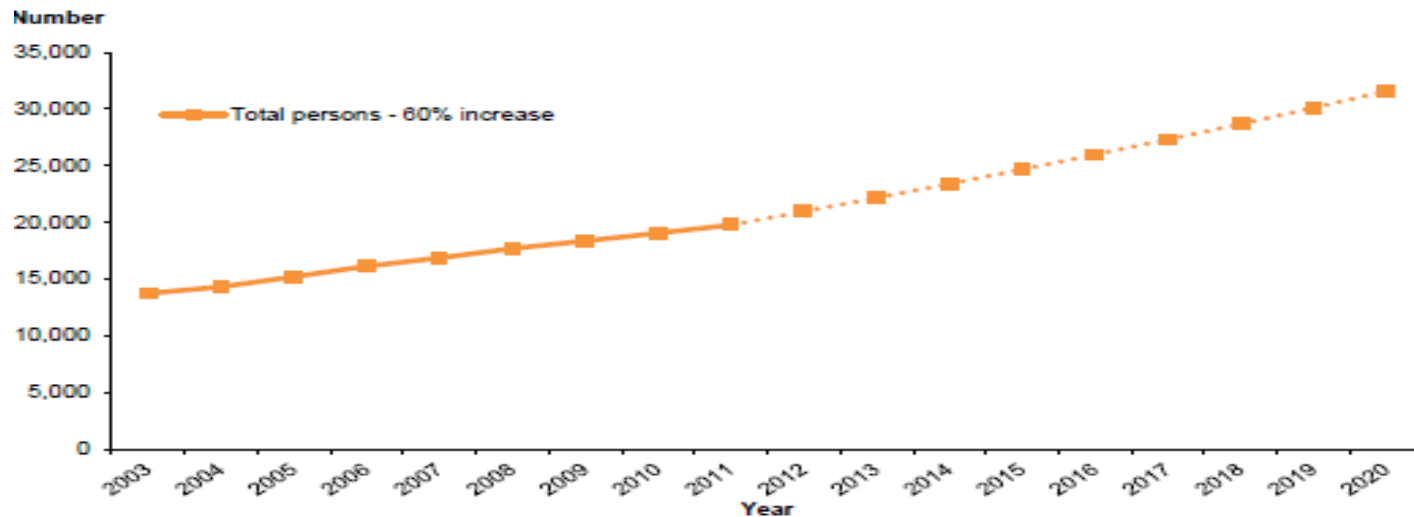
Moderate

High



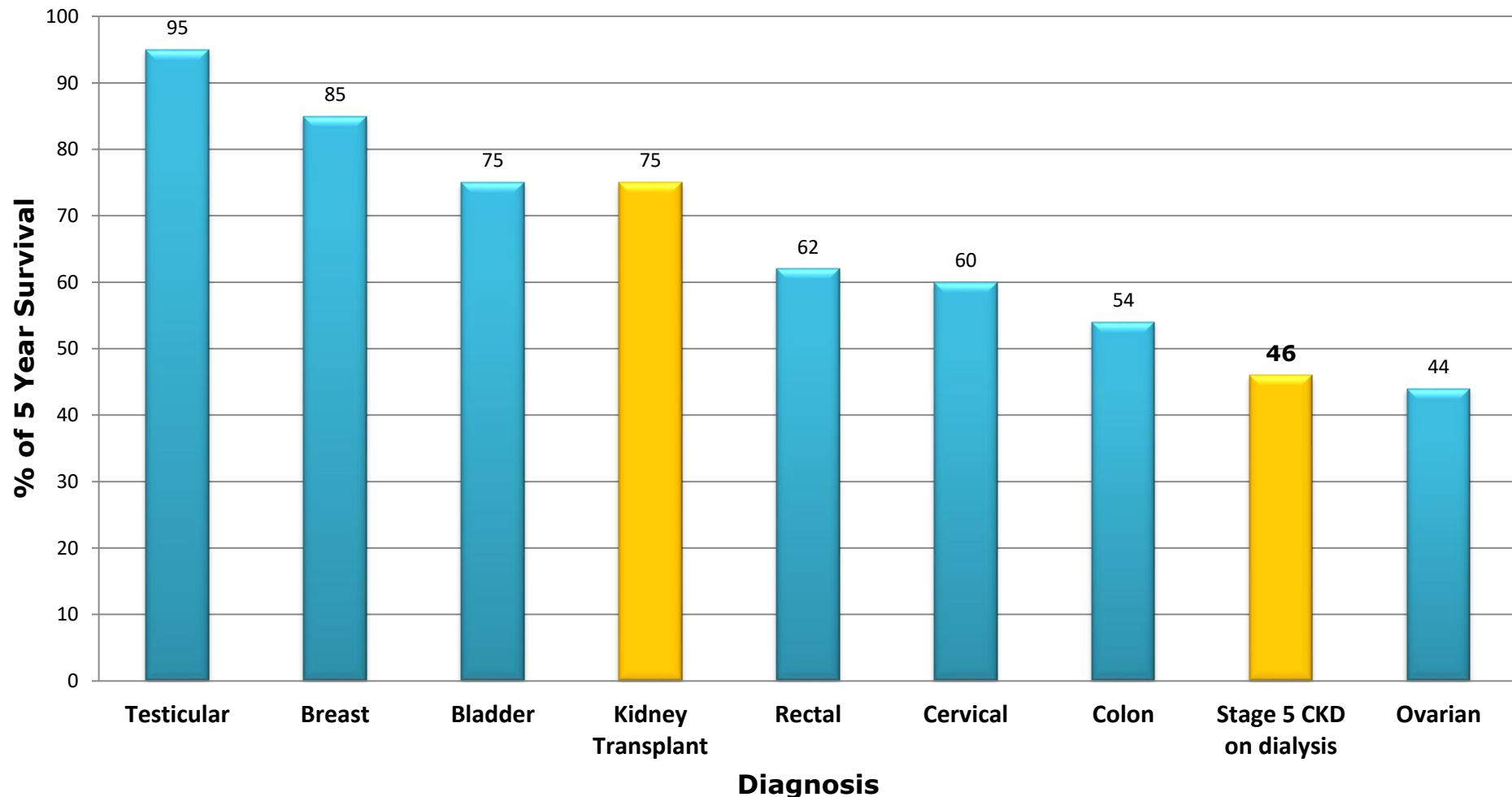
Why worry about CKD & ESKD?

Prevalence of registered and projected treated-ESKD, for all patients and by incident age, 2003-2020

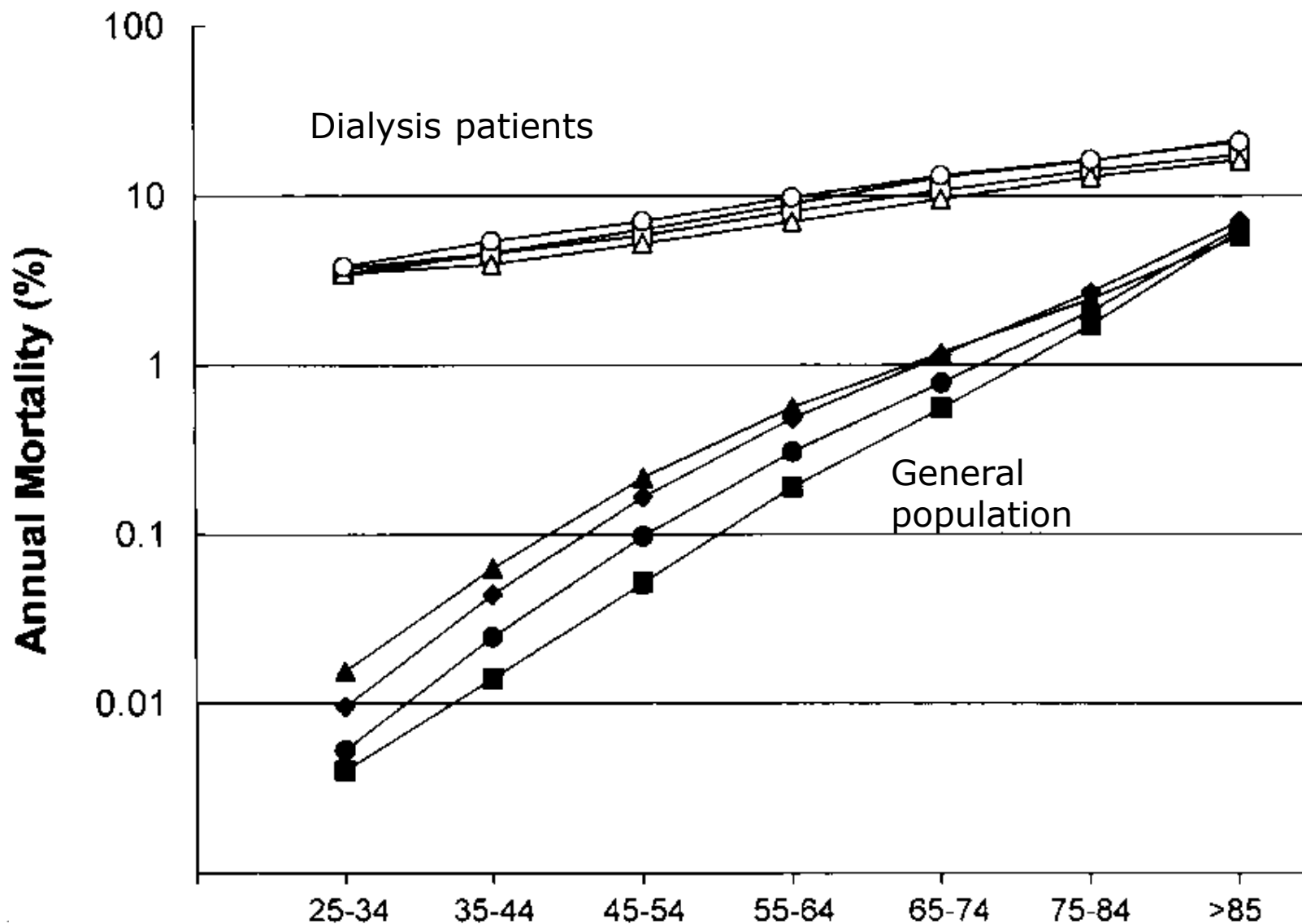


CKD survival

5 year survival of patients aged 60 years with common cancers compared with CKD

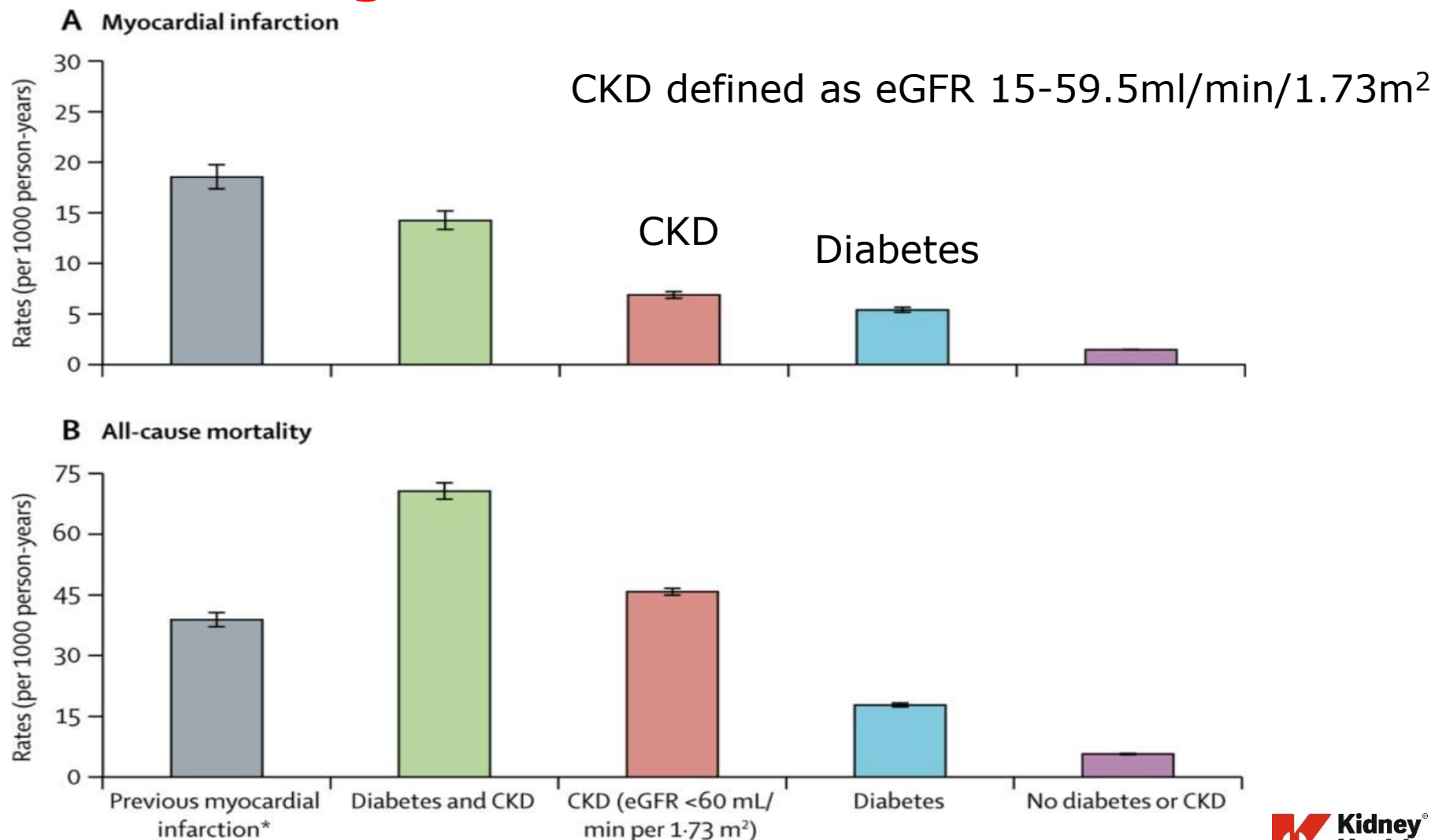


ESKD & cardiovascular mortality



CVD risk

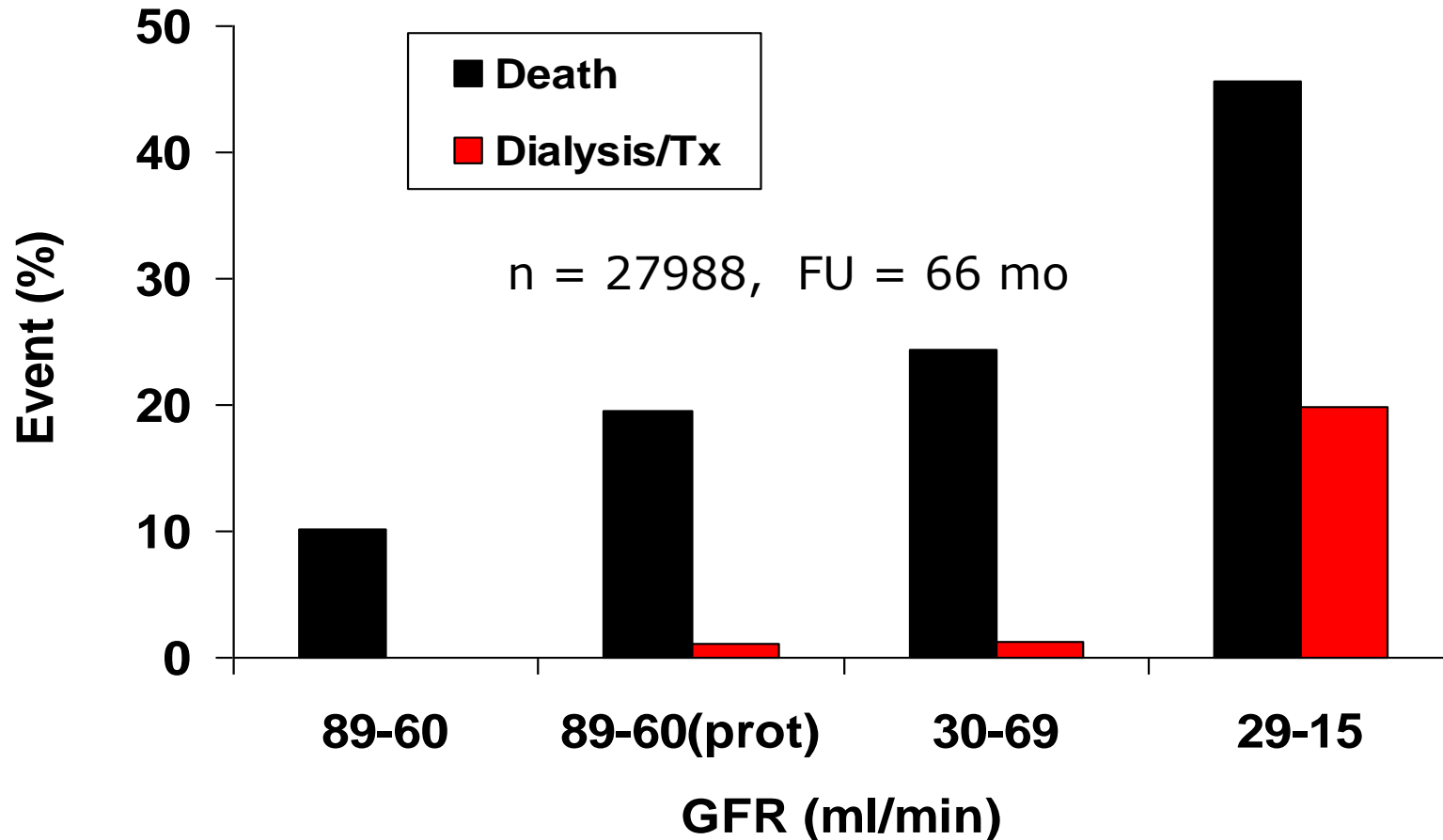
eGFR <60mL/min defines a coronary heart disease risk greater than diabetes



CVD risk in CKD

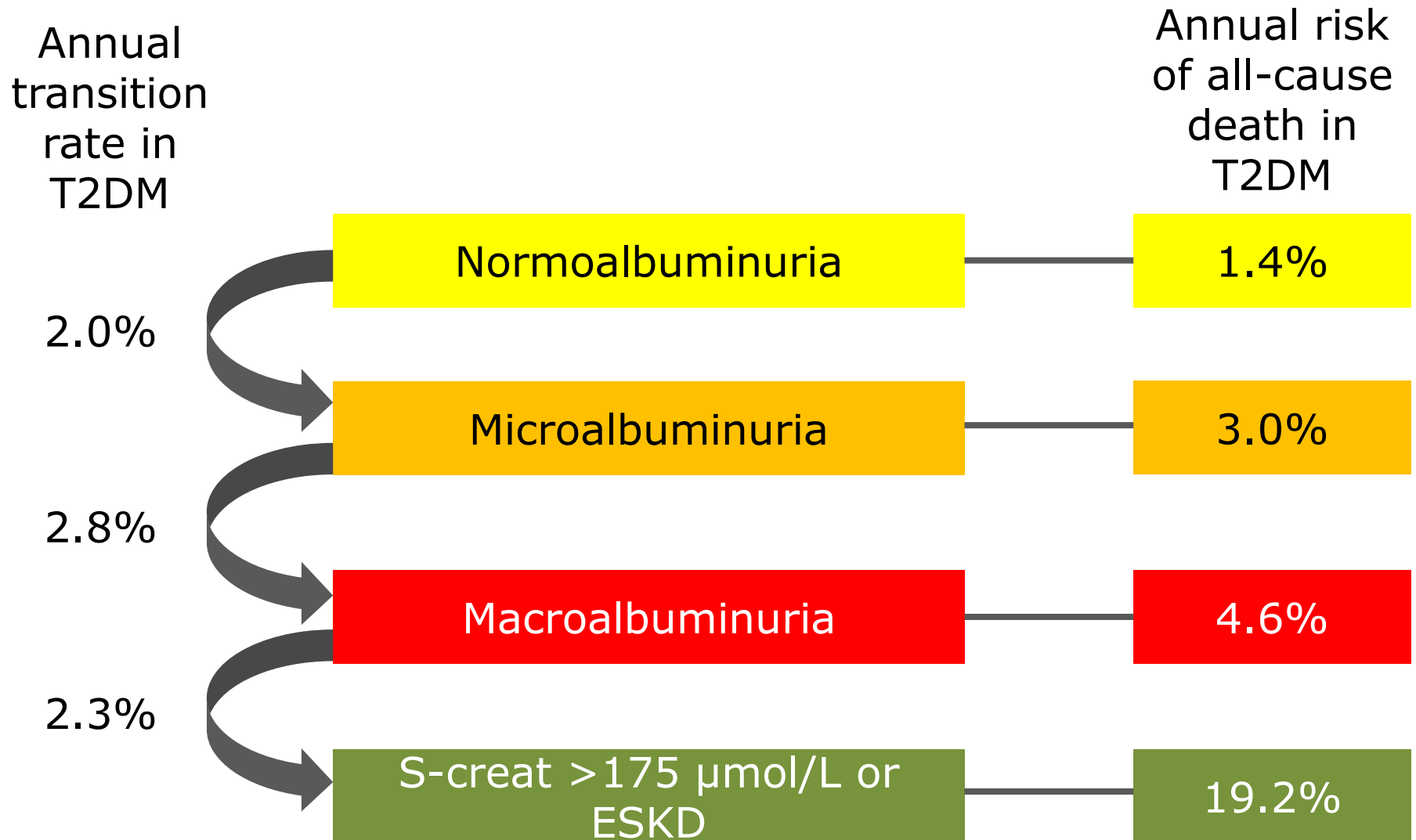
Kidney & cardiovascular outcomes in patients with CKD

Kaiser Permanente Longitudinal Study

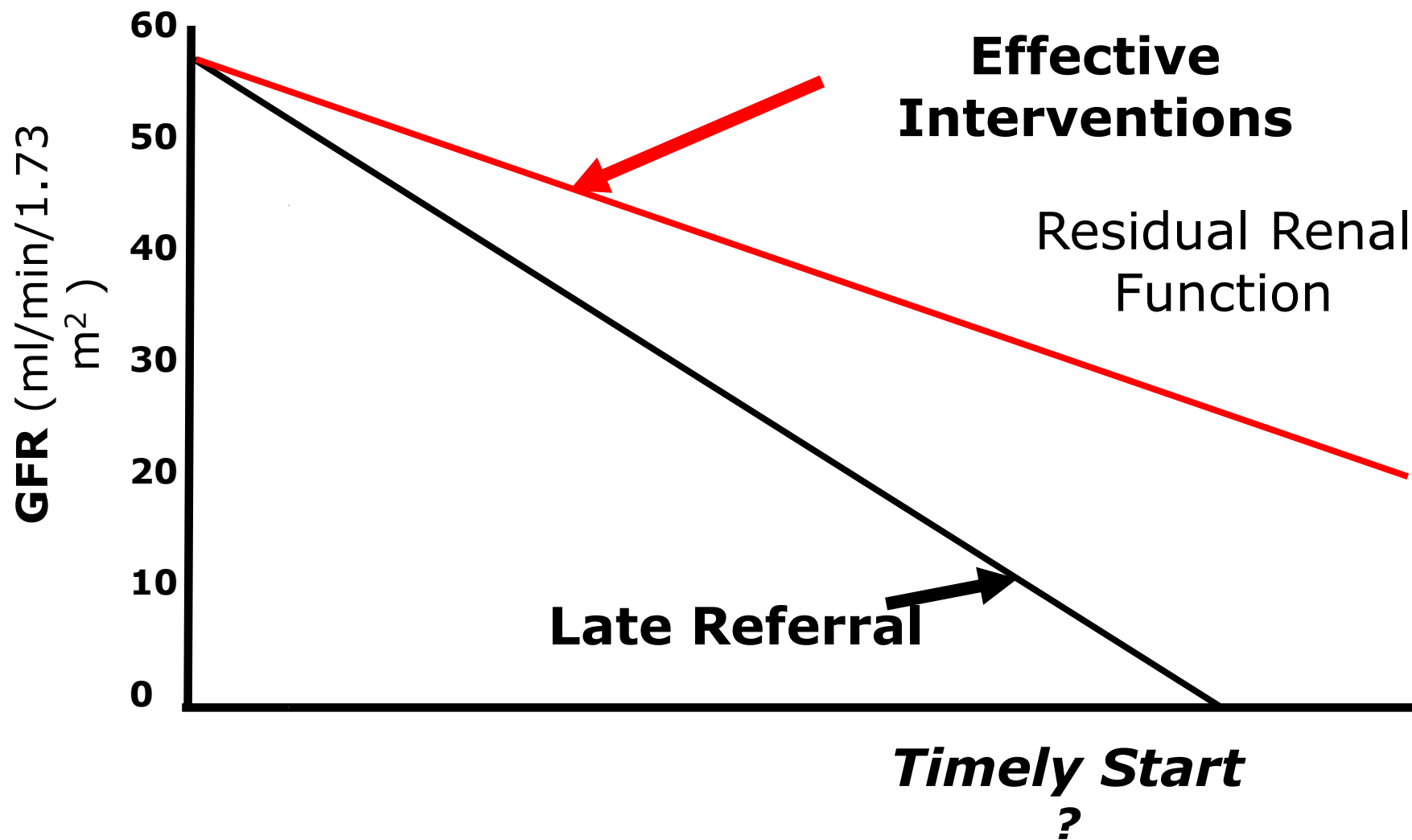


Patients with CKD are 20 times more likely to die from cardiovascular events than survive to reach dialysis

Stages of nephropathy in diabetes

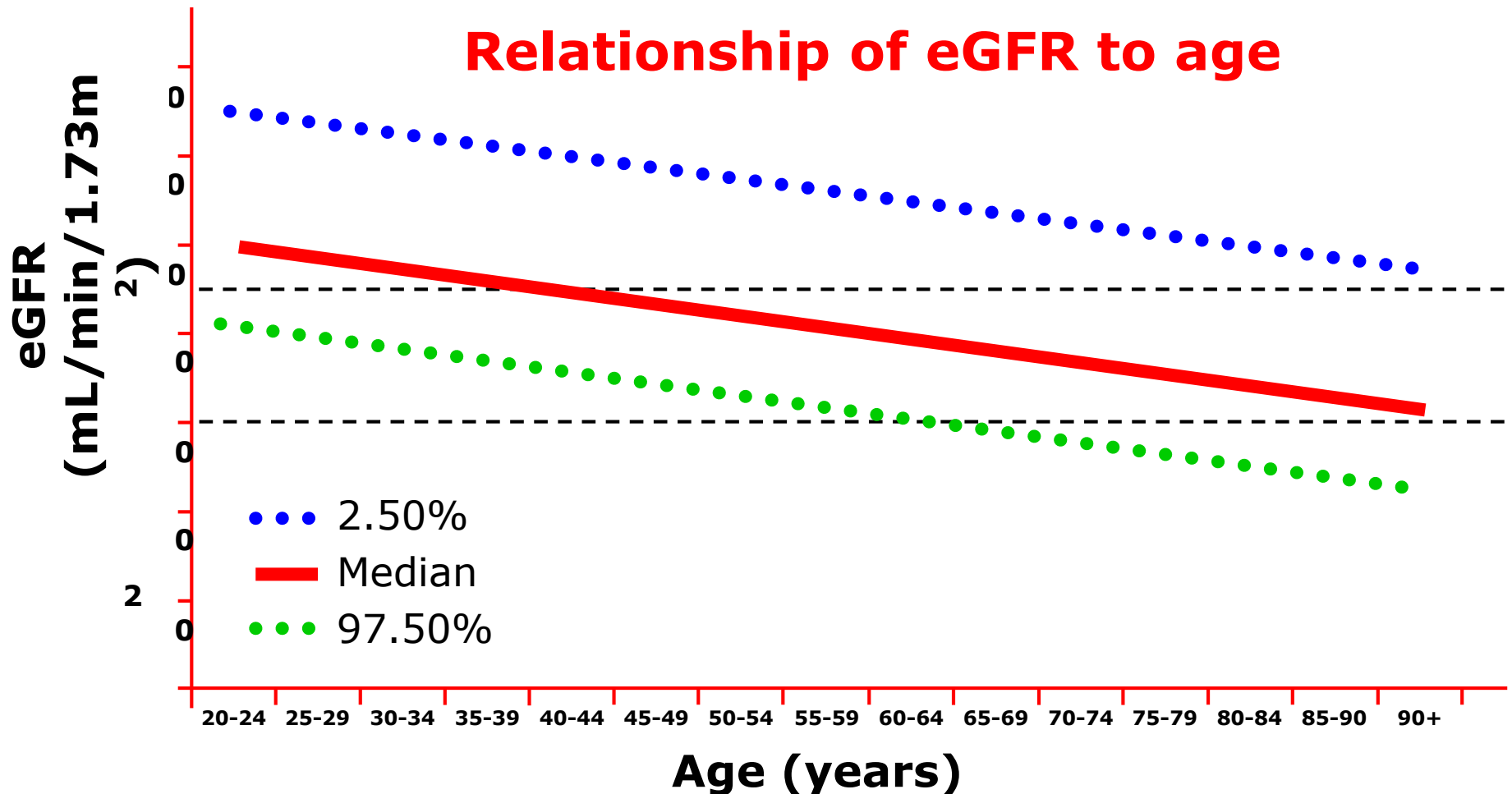


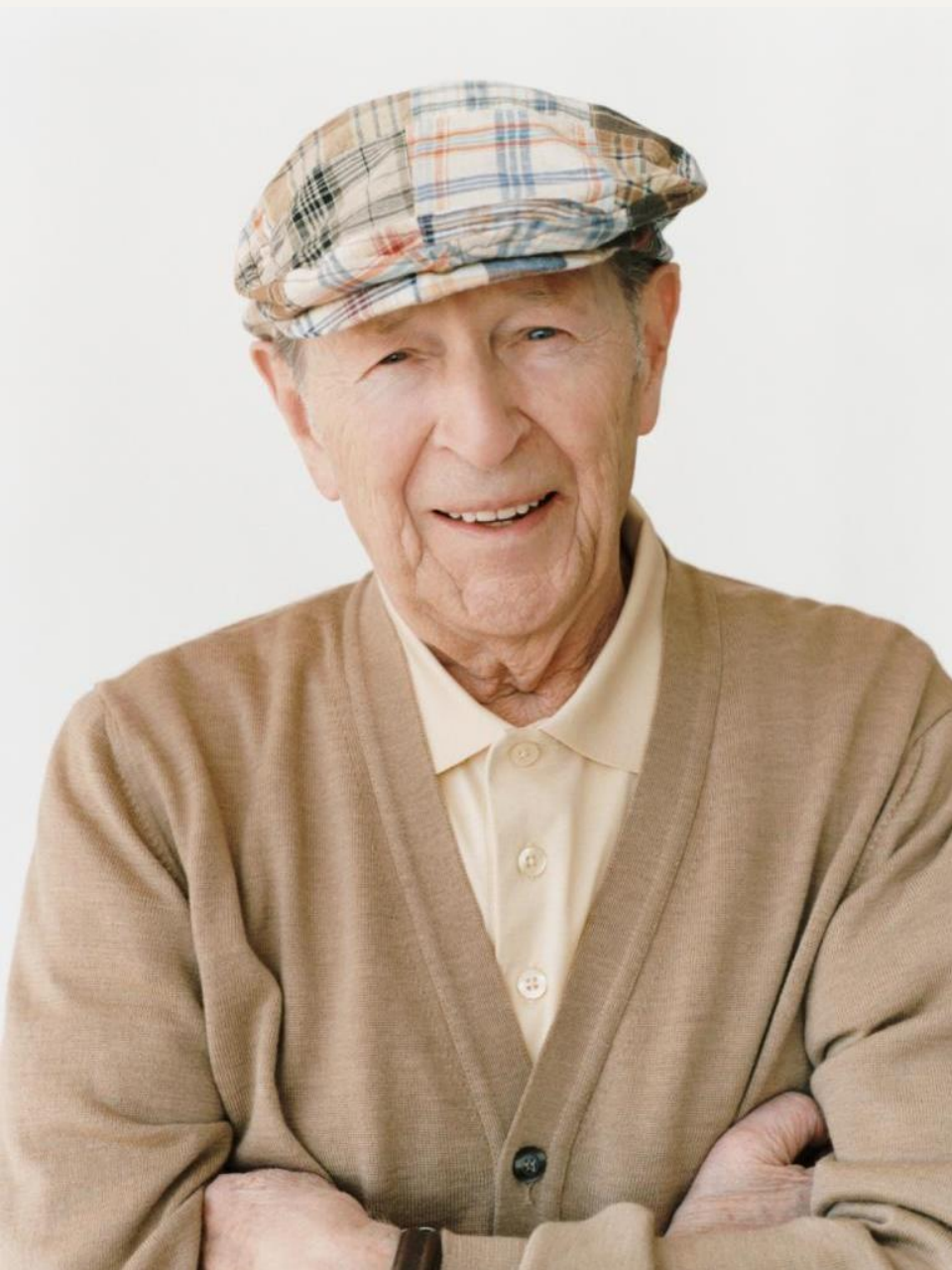
Intervention & management



Age and kidneys

Relationship between age & kidney function





Case study - Bruce B

Background

- 74 years old
- Retired small business owner

Bruce sees you about abdominal pain



Case study - Bruce

Medical history



Smoker	20 cigarettes/day (35 pack-year history)
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Alcohol	30g/day (3 standard drinks)
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Hypertension	20 years
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Type 2 Diabetes	5 years - <i>takes oral hypoglycaemics</i>
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Infra-renal AAA 4cm	Incidental finding on CT for abdominal pain
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Stress echo	No inducible ischaemia
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Medications	Amlodopine Pravastatin Gliclazide Aspirin (low dose)
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Case study – visit 1

Blood pressure 190/84 mmHg
Peripheral pulses present

Creatinine 160 $\mu\text{mol/L}$

eGFR 36 mL/min/1.73m² (has been consistently below 40 mL/min/1.73m² for 6 months)

Total cholesterol 6.7 mmol/L

Triglycerides 4.1 mmol/L

Full blood count Normal

Urine ACR 2.4 mg/mmol

Fundi Normal



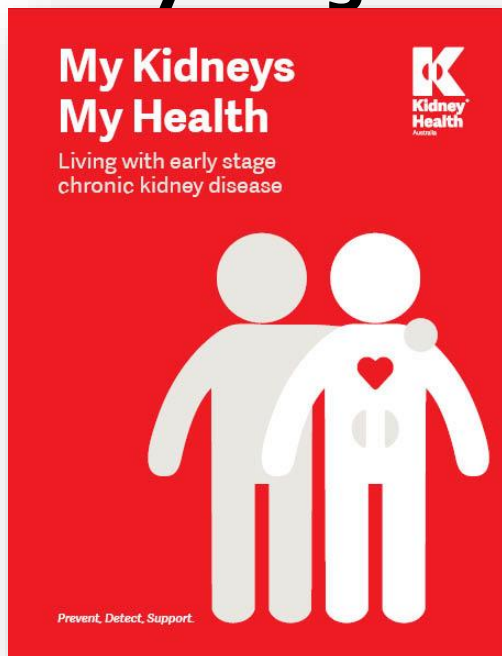
Case study - Bruce

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

Resources

My Kidneys, My Health Handbook & App

Free resource for patients newly diagnosed with early stage CKD



App available on
iTunes and
Google Play app
stores



Hardcopy books available
to order visit

www.kidney.org.au



Case study

Answer **True** or **False** to each of the statements below

- a) The absence of albuminuria excludes diabetic kidney disease
- b) Quantitation of albuminuria will give important prognostic information
- c) He should not be started on an Angiotensin converting enzyme (*ACE*) inhibitors and angiotensin II receptor blockers (*ARB*) to slow progression of kidney disease as he has CKD Stage 3b
- d) His smoking will worsen his kidney function
- e) Lipid lowering therapy has been proven to slow progression of kidney disease
- f) Cardiovascular disease risk - Bruce's CVD risk should be determined using the *absolute risk tool*



Case study - answer

a) The absence of albuminuria excludes diabetic kidney disease

FALSE

- 20-30% of diabetic patients may have chronic kidney disease without evidence of albuminuria
 - ⇒ *Mechanism not well understood*
- Likely to progress with time



Case study - answer

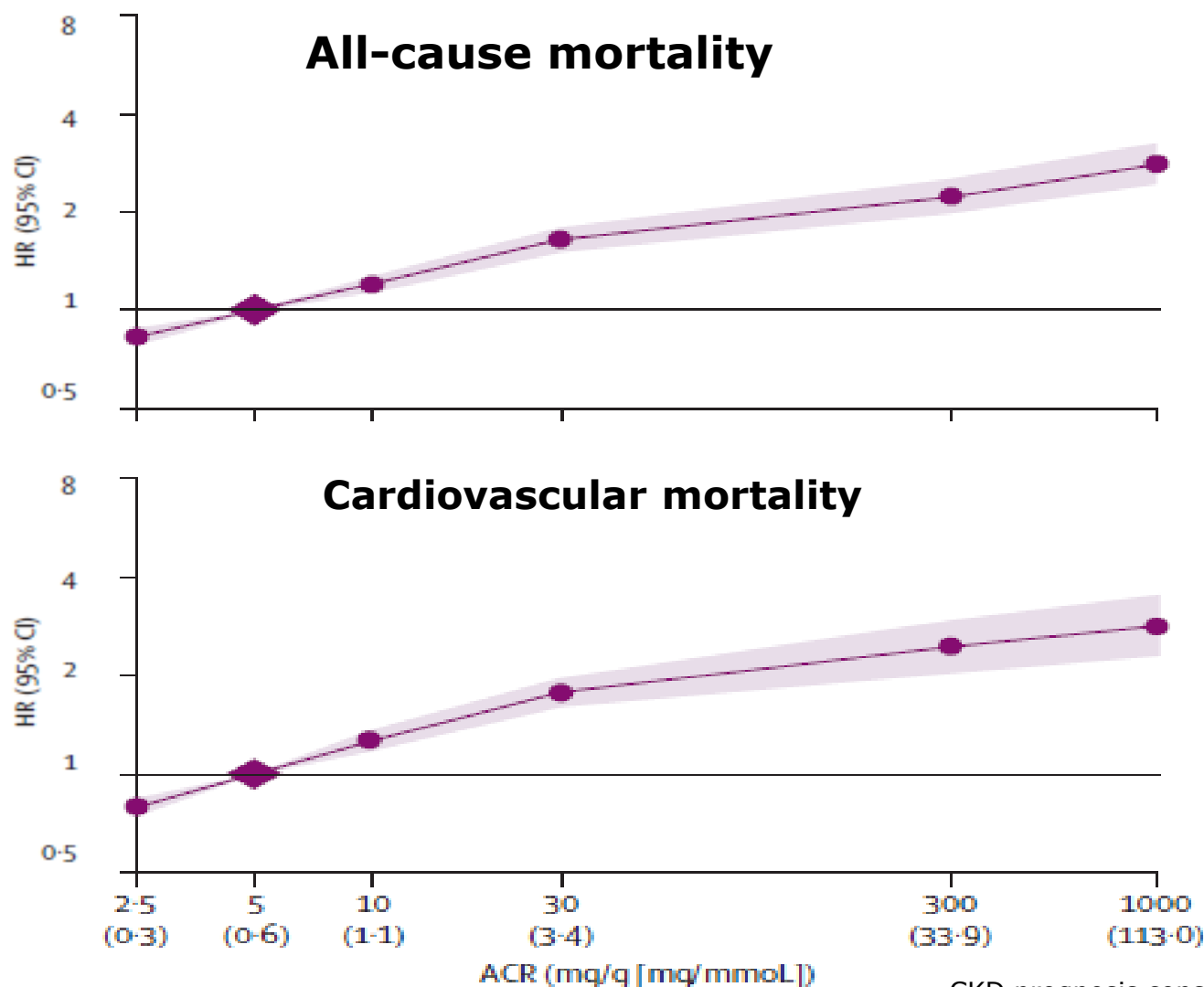
b) Quantitation of albuminuria will give important prognostic information

TRUE

- Increasing degrees of albuminuria lead to increasing risk of ESKD
 - ⇒ *Albuminuria is a stronger marker of risk of progression to ESKD than baseline eGFR*
 - ⇒ *But eGFR strong predictor of morbidity and mortality*
- Reduction of albuminuria predicts reduced mortality and reduced progression to ESKD

CKD risk

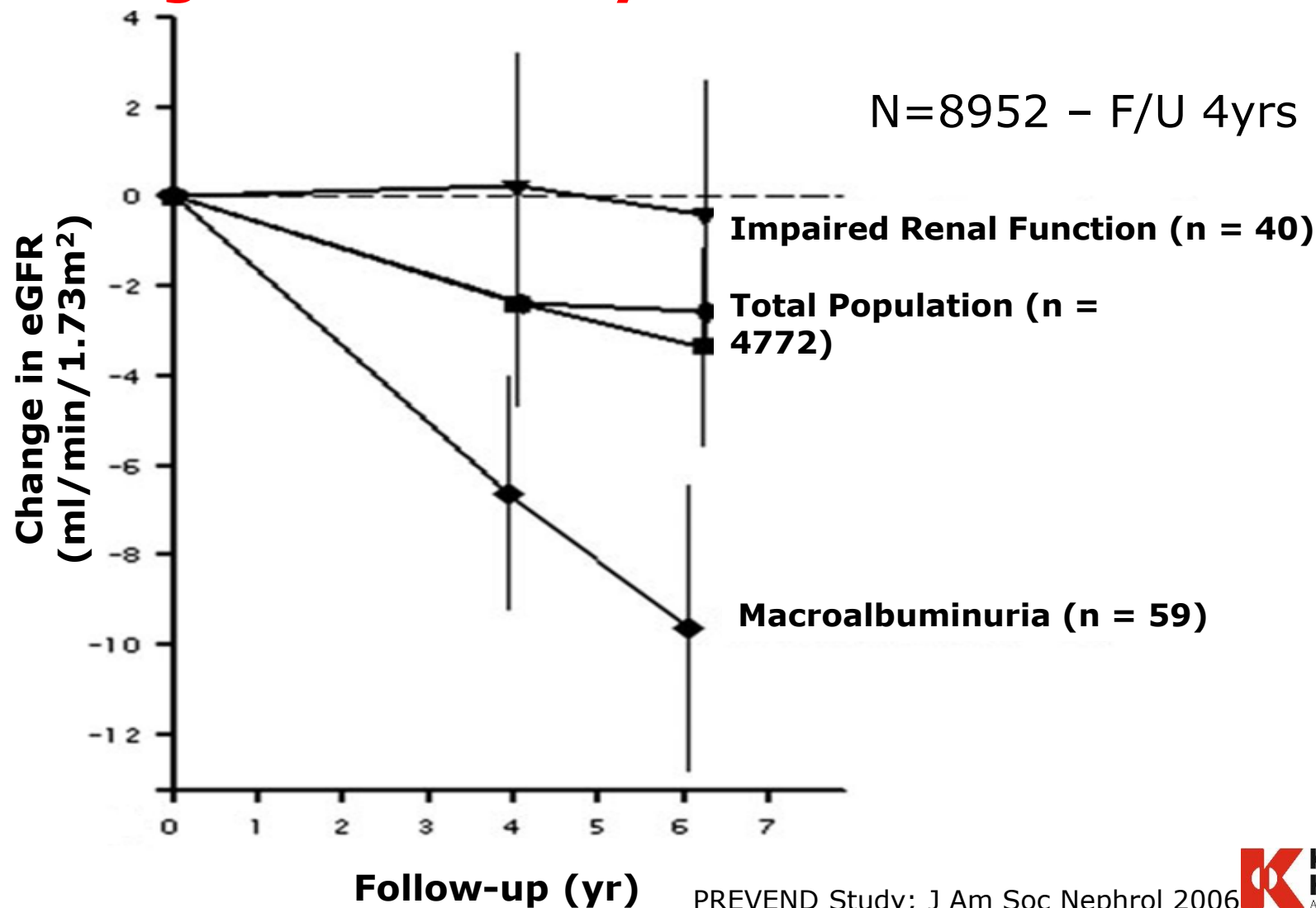
Urine ACR >1.1 mg/mmol is an independent predictor for all cause and CVD mortality in the general population



Meta analysis
105 872
participants
730 577 person-
years
14 studies

Kidney function marker

Macroalbuminuria is a better marker than GFR in predicting loss of kidney function



Albuminuria & ↓ GFR predict mortality & morbidity (RR)

		Norma l	Macroalbuminuri a	↓GFR
Mortality (RR)	CV	1	2.6	3.4
	non CV	1	1.5	3.0
Morbidity (RR)	CV	1	1.4	2.3



Case study - answer

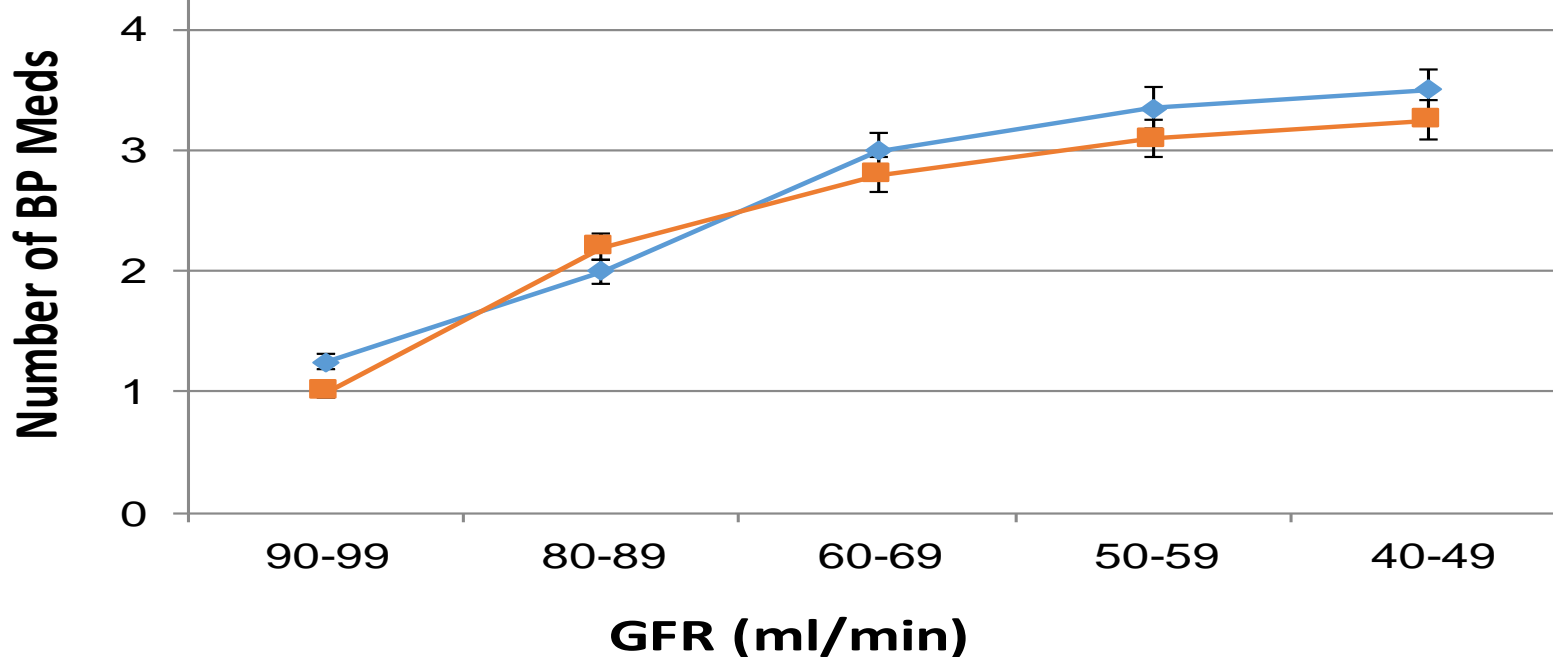
c) He should not be started on an ACE inhibitor or ARB to slow progression of kidney disease as he has CKD Stage 3b

FALSE

- ACEi's and ARB's have been shown to reduce the risk of CV events and death in people with CKD

Treatment of BP in CKD

- ACE inhibitor (ACEi) or Angiotensin Receptor Blocker (ARB)
 - Independent beneficial effect on CKD irrespective of effect on BP
- CKD patients often need multiple medications to achieve BP control
- Achieving BP goals improves outcomes

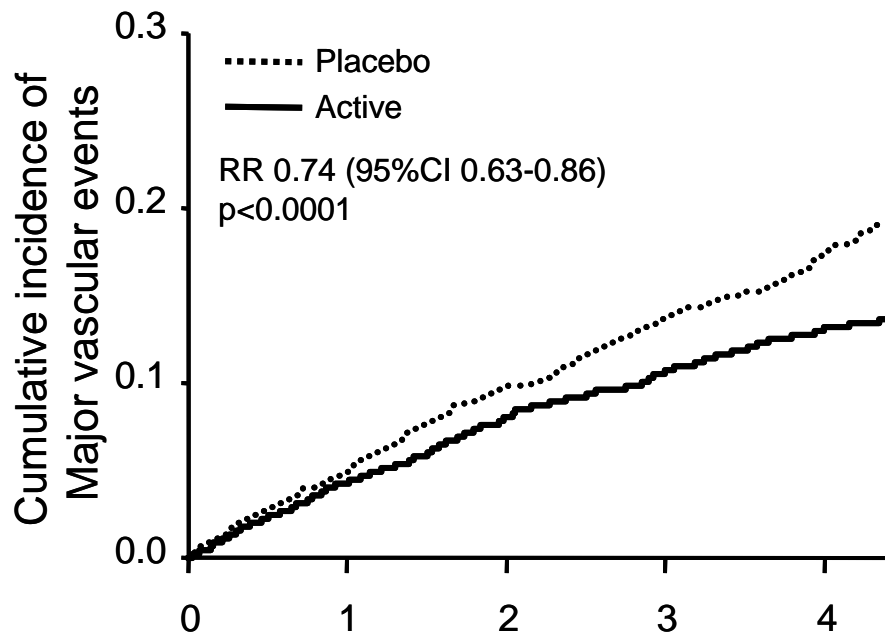


BP lowering in CKD

Blood pressure lowering in CKD: PROGRESS trial

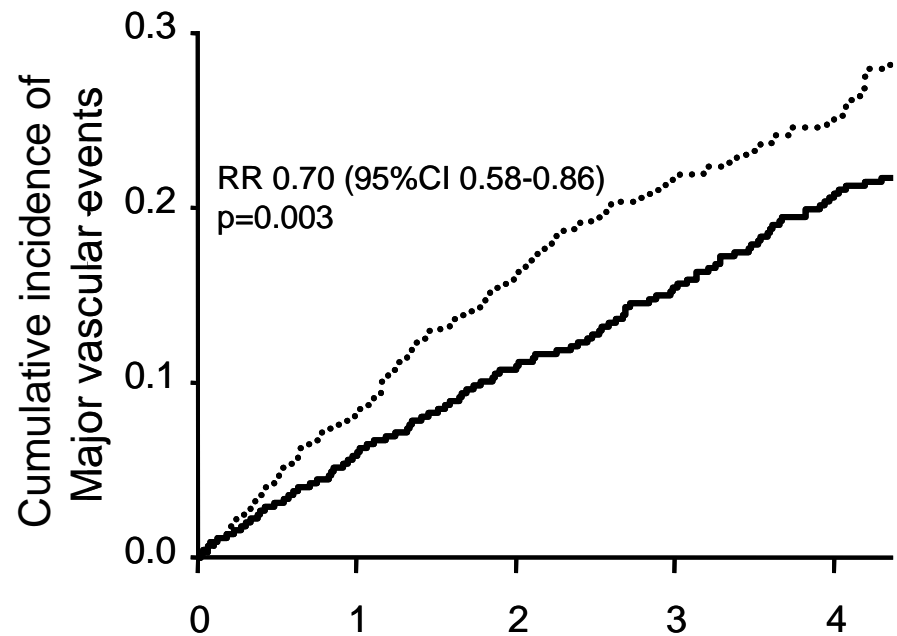
ACE +/- diuretic in people with previous cerebrovascular disease,
similar subgroup analyses published from several other trials

CCr \geq 60 ml/min



Number at risk		Follow-up (years)				
		0-1	1-2	2-3	3-4	4-5
Placebo	2,177	2,055	1,944	1,831	1,085	
Active	2,137	2,039	1,945	1,871	1,131	
Total	4,314	4,094	3,889	3,702	2,216	

CCr < 60 ml/min



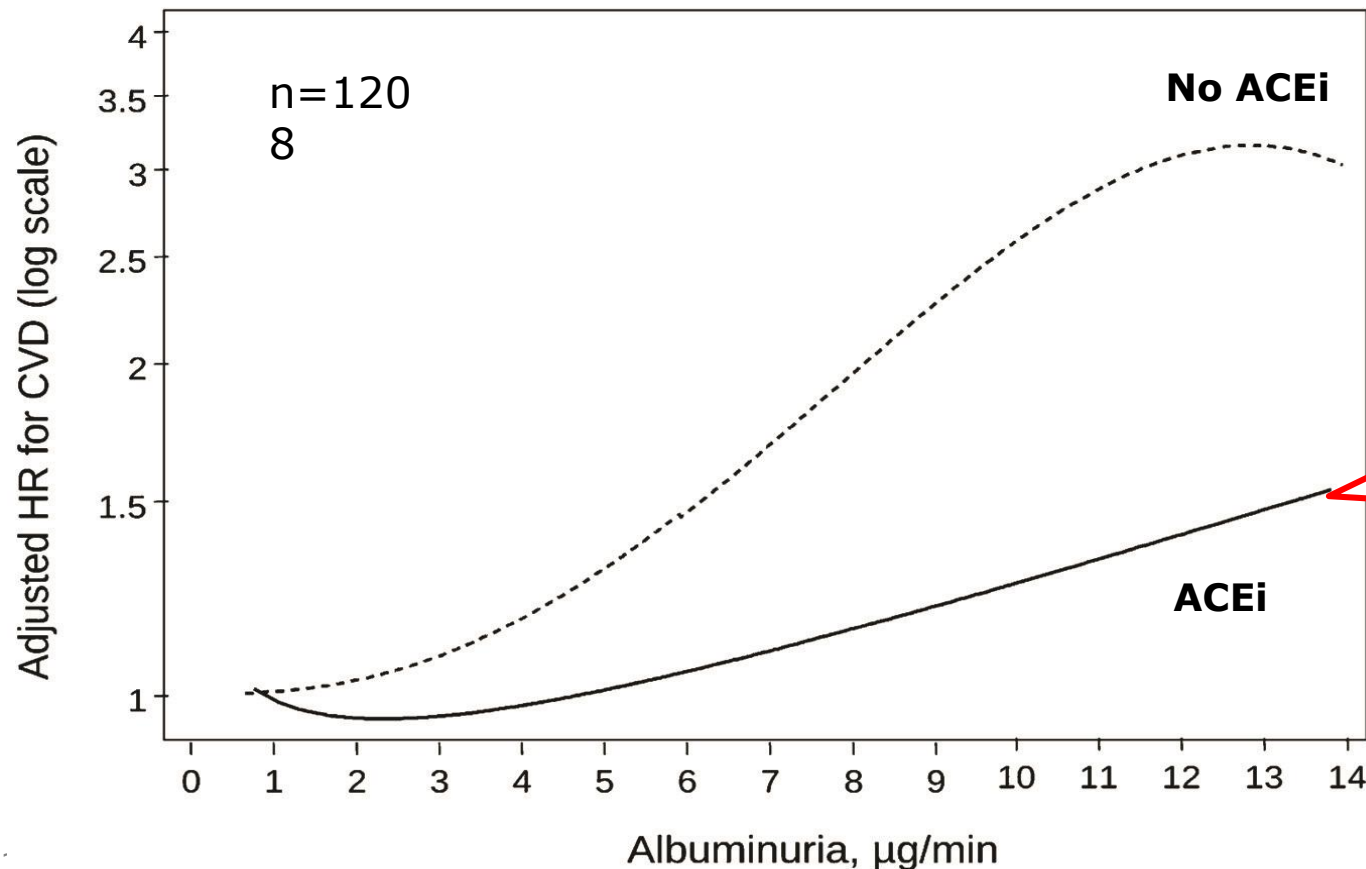
Number at risk		Follow-up (years)				
		0-1	1-2	2-3	3-4	4-5
Placebo	862	786	708	652	399	
Active	895	833	775	713	426	
Total	1,757	1,619	1,483	1,365	825	

Intervention and outcomes

ACE inhibitors in Type 2 Diabetes with hypertension The BENEDICT Trial

Adjusted Health Risks (HR) for major cardiovascular events
according to baseline albuminuria

ACEi yes-no



**Risk of CVD
is
significantly
reduced**

Target blood pressure in adults



Blood pressure goals

People with....	Maintain BP consistently <u>BELOW</u> (mmHg)
Albuminuria	<130/80
Diabetes	<130/80
Chronic Kidney Disease	<140/90

Risk stratification – blood pressure



- 10 mmHg \uparrow Systolic Blood Pressure results in 10.9% increase in Relative Risk of ESKD (RENAAL Study*)
- Greatest reduction in mortality in those with Pulse Pressure > 90 mmHg in RENAAL*

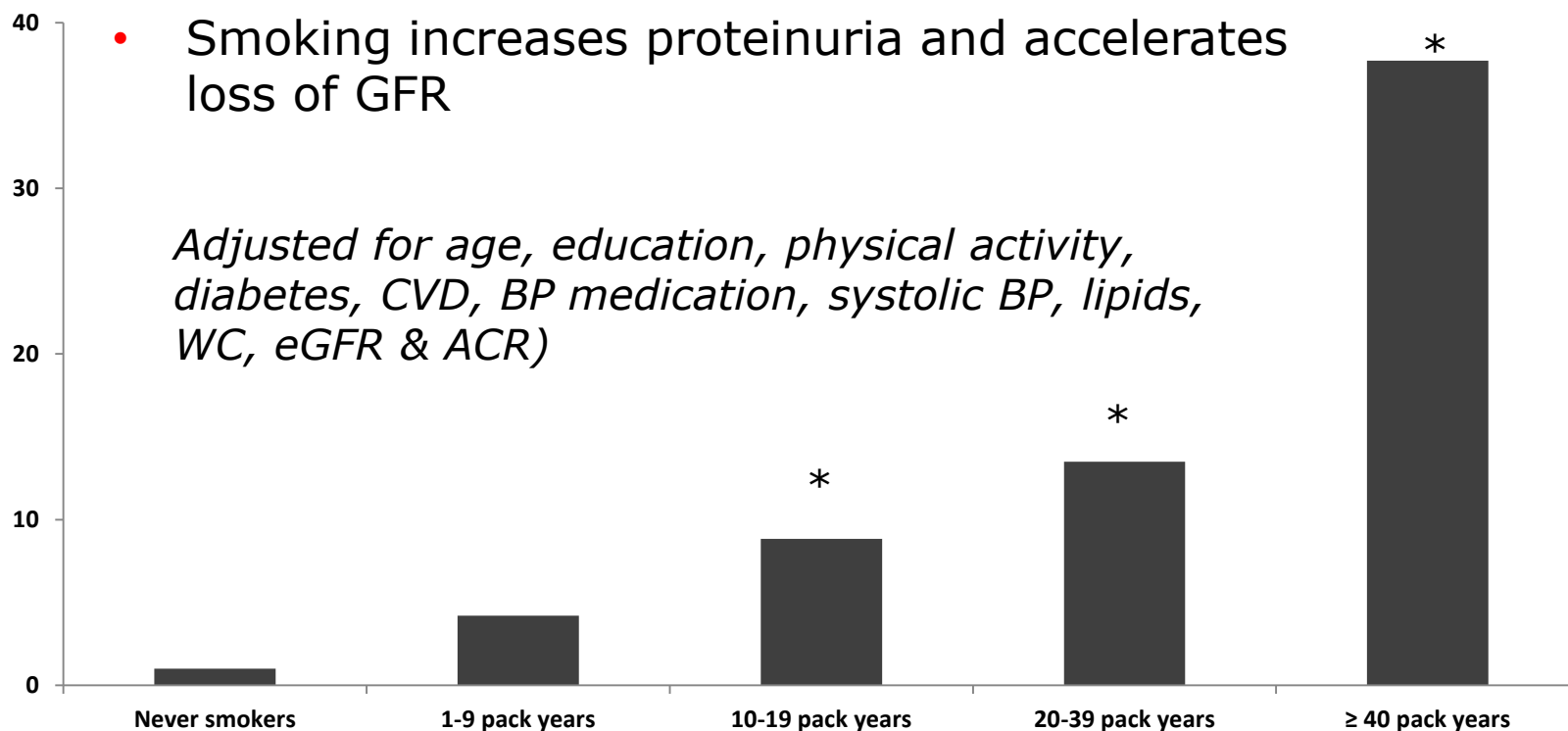


Case study – true or false?

d) His smoking will worsen his kidney function

TRUE

- Smoking is associated with kidney damage in the population AusDiab Study
- Smoking increases proteinuria and accelerates loss of GFR



* $p < 0.05$ compared with 'never smokers'



Case study - Answer

e) Lipid lowering therapy has been proven to slow progression of kidney function

FALSE

- Post hoc analysis of CKD trials show no consistent pattern of responses
- Major trial recently showed CV event reduction in CKD (non-dialysis) but no impact on slowing progression of CKD*



*Baigent et al, Lancet 2011

Lipid lowering in CKD

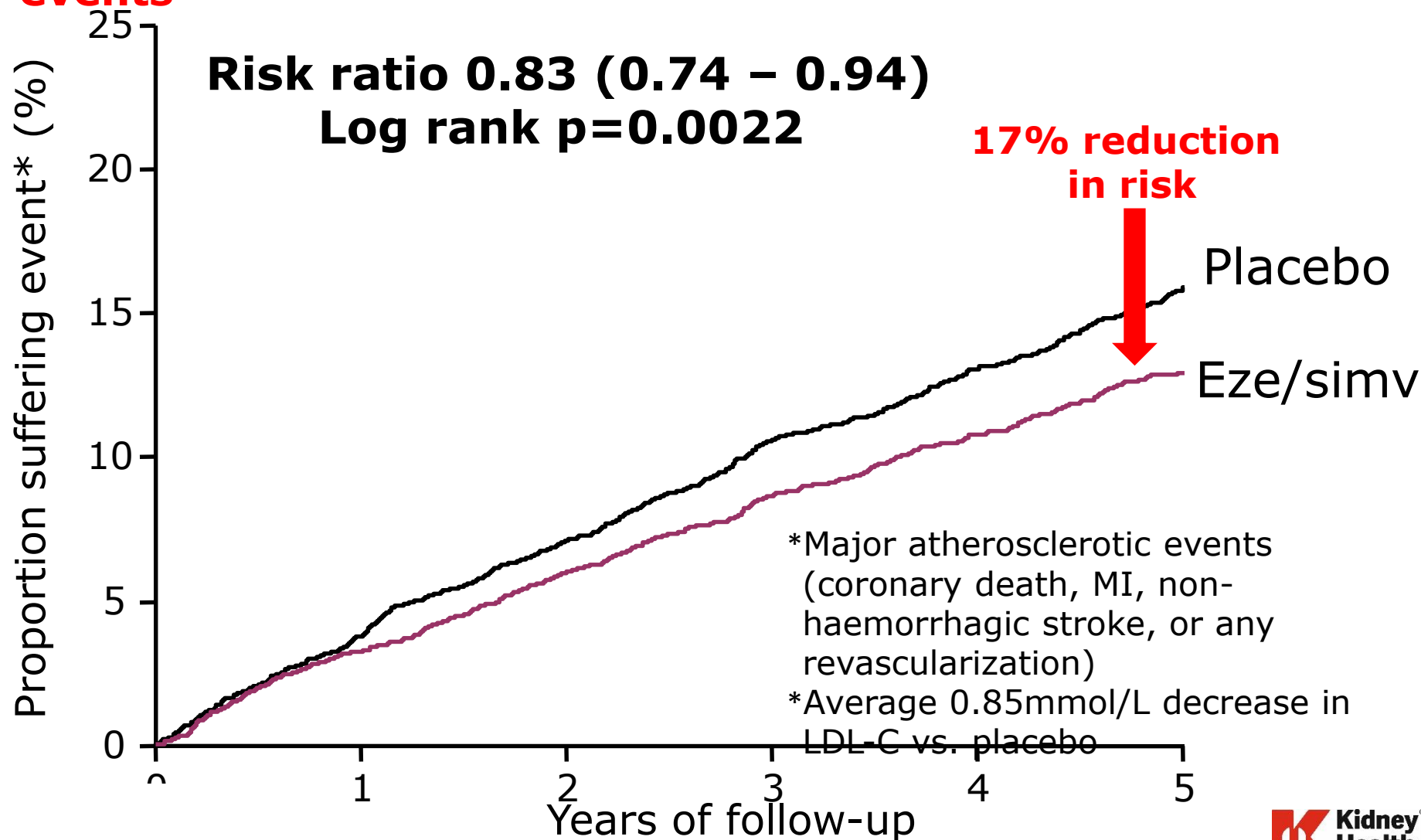
Study of Hear And Renal Protection (SHARP)

There is strong evidence that lipid lowering in people with CKD will decrease the risk of atherosclerotic events

- Recruited 9438 patients with CKD, including 1/3 on dialysis
- No previous cardiovascular events
- Randomised to 20 mg simvastatin + 10 mg ezetimibe vs placebo
- Mean baseline LDL-C level of 2.8mmol/L
- Outcome was first major atherosclerotic event (non-fatal myocardial infarction or coronary death, non-haemorrhagic stroke, or any arterial revascularisation procedure)
- Followed for an average of 5 years

CV events

SHARP results: 17% reduction in major atherosclerotic events*



Statin statement

In adults with newly identified CKD, evaluation with a fasting lipid profile is recommended. Follow-up measurement of lipid levels may not be needed

- If aged >50 years with any stage of CKD (irrespective of lipid levels):
 - Statin if eGFR is >60 mL/min/1.73m²
 - Statin or statin/ezetimibe combination if eGFR is <60 mL/min/1.73m²
- If aged <50 years with any stage of CKD (irrespective of lipid levels):
 - Statin if presence of one or more of: coronary disease, previous ischaemic stroke, diabetes or estimated 10-year incidence of fatal or non-fatal myocardial infarction above 10%
- Lifestyle advice if hypertriglyceridaemia is present



Case study - Answer

f) Assessment for cardiovascular disease risk- Bruce's CVD risk should be determined using the *absolute risk tool*.

FALSE

- People with moderate or severe CKD* are considered to be at the highest risk of a cardiovascular event and do *not* need to be assessed by the cardiovascular risk tool

*defined as persistently having a urine ACR > 25mg/mmol (males) or > 35mg/mmol (females) or eGFR < 45ml/min/1.73m²

CKD risk

Australian Absolute Cardiovascular Disease Risk Calculator

www.cvdcheck.org.au

Sex ☒ Male ☐ Female

A systolic blood pressure value of 180 mmHg or above indicates an increased absolute risk of cardiovascular disease and does not require numerical calculation of absolute risk

Diabetes
AUSTRALIA

Bruce has an eGFR of 36 mL/min/1.73m²
His high BP automatically means he is at high risk
(>15% chance) of a CVD event in next 5 years.
He should not have the Absolute CVD risk tool
applied.

CVD risk

anyone with...

- **eGFR < 45 mL/min/1.73m² or persistent proteinuria**
- Diabetes and microalbuminuria
- Diabetes and age > 60 years
- Established cardiovascular disease
- Familial hypercholesterolemia or total cholesterol above 7.5
- Severe hypertension
 - Systolic 180 mmHg or greater
 - Diastolic 110 mmHg or greater

is already at the highest risk of a cardiovascular event,

therefore the calculator should not be used

CVD risk reduction in CKD

- CKD is a potent risk factor
- essential to determine CKD **before** using the tool www.cvdcheck.org.au
- with CKD, individuals cardiac death risk is 2-3 greater than without CKD
- with CKD, individuals are **20 times** more likely to **die** from CVD **than survive** to need dialysis or transplant



Case study - Bruce

- Commenced on perindopril/ indapamide*
- Seen 4 weeks later and reassessed

	4 Weeks ago	Today
BP	190/84 mmHg	150/76 mmHg
Creatinine	160 $\mu\text{mol/L}$	189 $\mu\text{mol/L}$
eGFR	36 mL/min/1.73m ²	29 mL/min/1.73m ²
Potassium	-	5.8 mmol/L
Urine ACR	2.4 mg/mmol	2.6 mg/mmol

*Usual practice is to increase by one antihypertensive agent at a time



Case study - question

Q2: Do You...

- a) Cease the ACEi and commence another drug
- b) Cease the ACEi and check for a renal artery stenosis
- c) Continue the ACEi and check for a renal artery stenosis
- d) Add another drug for better BP control



Case study - answer

d) Add another drug for better blood pressure control

Rationale:

- Decrease in eGFR of **<25%**, not unexpected after BP lowering; a result of decreased perfusion
- Target BP in CKD is **<140/90 mmHg**
- ACEi may have benefit for kidney disease
- K⁺ needs watching but not a concern at this level
-prescribe low K⁺ diet



Case study - Bruce

Seen 1 month later

	1 st visit	4 weeks later	Today (8 weeks later)
BP	190/84 mmHg	150/76 mmHg	134/68 mmHg
Creatinine	160 µmol/L	189 µmol/L	180 µmol/L
eGFR	36 mL/min/1.73m ²	29 mL/min/1.73m ²	31 mL/min/1.73m ²
Potassium	-	5.8 mmol/L	5.4 mmol/L
Ca			2.05 mmol/L
PO ₄			1.54 mmol/L
Hb			98g/L Normocytic / normochromic
Urine ACR	2.4 mg/mmol	2.6 mg/mmol	2.6 mg/mmol



Case study - question

Q3: What would you do?

- a) Implement an **Orange Clinical Action Plan**
- b) Check iron studies
- c) Check Vitamin B12 and folate levels
- d) Check Vitamin D and PTH
- e) All of the above



Case study - answer

e. All of the above

Results

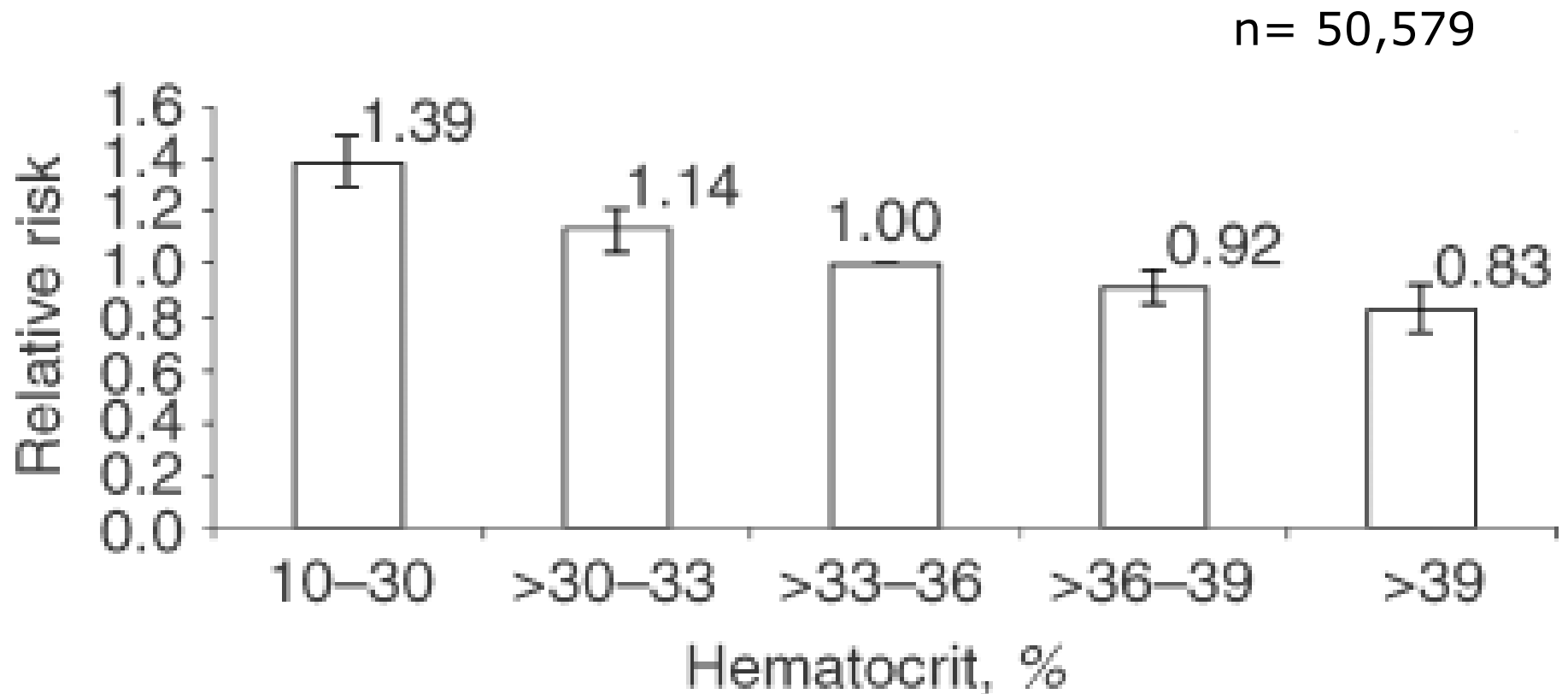
Iron studies	Normal range
B12 and folate	Normal
TSH	Normal
PTH	18 pmol/L (N<8 pmol/L)
Vitamin D	25 nmol/L - moderate deficiency

Anaemia

- Anaemia of CKD is related to both:
 - reduced erythropoietin production by the kidney
 - resistance to the action of erythropoietin
- Anaemia due to CKD begins at GFR <60mL/min
 - Prevalence of anaemia increases markedly with decreasing GFR
 - Common when GFR < 30 mL/min (30-40%)
- CKD anaemia is a diagnosis of exclusion
 - Need to ensure not Fe deficient or B12/ folate deficient, or hypothyroid

Anaemia is associated with mortality in dialysis patients

Adjusted Relative Risk of death due to any cardiac cause, according to Haematocrit



Target Hb for anaemia in CKD

Optimal Hb level not known

RCT – no benefit above 120 g/L

Individualise treatment

Refer to PBS criteria



Resources

CKD patient fact sheets

Available along with more kidney health fact sheets at www.kidney.org.au

HOW TO LOOK AFTER YOUR KIDNEYS

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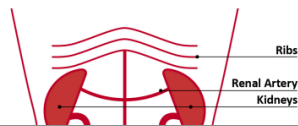
WHAT ARE THE KIDNEYS?

The role of the kidneys is often underrated when we think about our health. In fact, the kidneys play an important role in the daily workings of our body. They are so important that nature gave us two kidneys to cover the possibility that one might be lost to an injury. They are so important that with no kidney function death occurs within a few days.

The kidneys play a major role in maintaining your general health and wellbeing. Think of them as a very sophisticated, environmentally friendly waste disposal system, which sorts non-recyclable waste from recyclable waste, 24 hours a day, seven days a week, while also cleaning your blood.

Most people are born with two kidneys, each one about the size of an adult fist, bean-shaped, and weighing around 150 grams. The kidneys are located at both sides of your backbone, just under the rib cage or above the small of your back, and are protected from injury by a large padding of fat, lower ribs and several muscles.

In each kidney, blood is filtered through millions of mini-filters called 'nephrons'. The excess fluid and unwanted chemicals from this filtering process become urine and are passed from the kidneys to your bladder.



Last Reviewed July 2015
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Fact sheet

Blood Pressure and Chronic Kidney Disease

i

What is blood pressure?

Blood pressure is the pressure of the blood in the arteries as it is pumped around the body by the heart. Blood pressure does not stay the same all the time. It changes to meet the demands of your body. It is usually at its highest when we exercise and lowest when we sleep. It can also rise due to anxiety, excitement, activity or nervousness.

How is blood pressure measured?

Blood pressure is usually measured by wrapping an inflatable pressure cuff around the upper arm. Blood pressure is recorded as two numbers, for example 140/90 mmHg.

The larger number indicates the pressure in the arteries as the heart squeezes out blood during each beat. This is called the systolic blood pressure. The lower number indicates the pressure as the heart relaxes before the next beat. This is called the diastolic blood pressure.



CKD & anaemia summary

- Common and important to correct
- PBS criteria - can't start EPO till Hb <100g/L
- Need to have Nephrologist endorsement to start
- Ensure not iron deficient
- All respond – need to dose titrate
- Most self administer SC every 1-4 weeks
- All will need extra iron (oral or i.v.)



All iron deficiency needs investigation



Case study - Bruce

Calcium and phosphate at today's visit

	1 st visit	4 weeks later	Today (8 weeks later)
BP	190/84 mmHg	150/76 mmHg	134/68 mmHg
Creatinine	160 $\mu\text{mol/L}$	189 $\mu\text{mol/L}$	180 $\mu\text{mol/L}$
eGFR	36 mL/min/1.73m^2	29 mL/min/1.73m^2	31 mL/min/1.73m^2
Urine ACR	2.4 mg/mmol	2.6 mg/mmol	2.6 mg/mmol
Ca			2.05 mmol/L
PO₄			1.54 mmol/L
Hb			98g/L Normocytic / normochromic

Complications – mineral and bone disorder

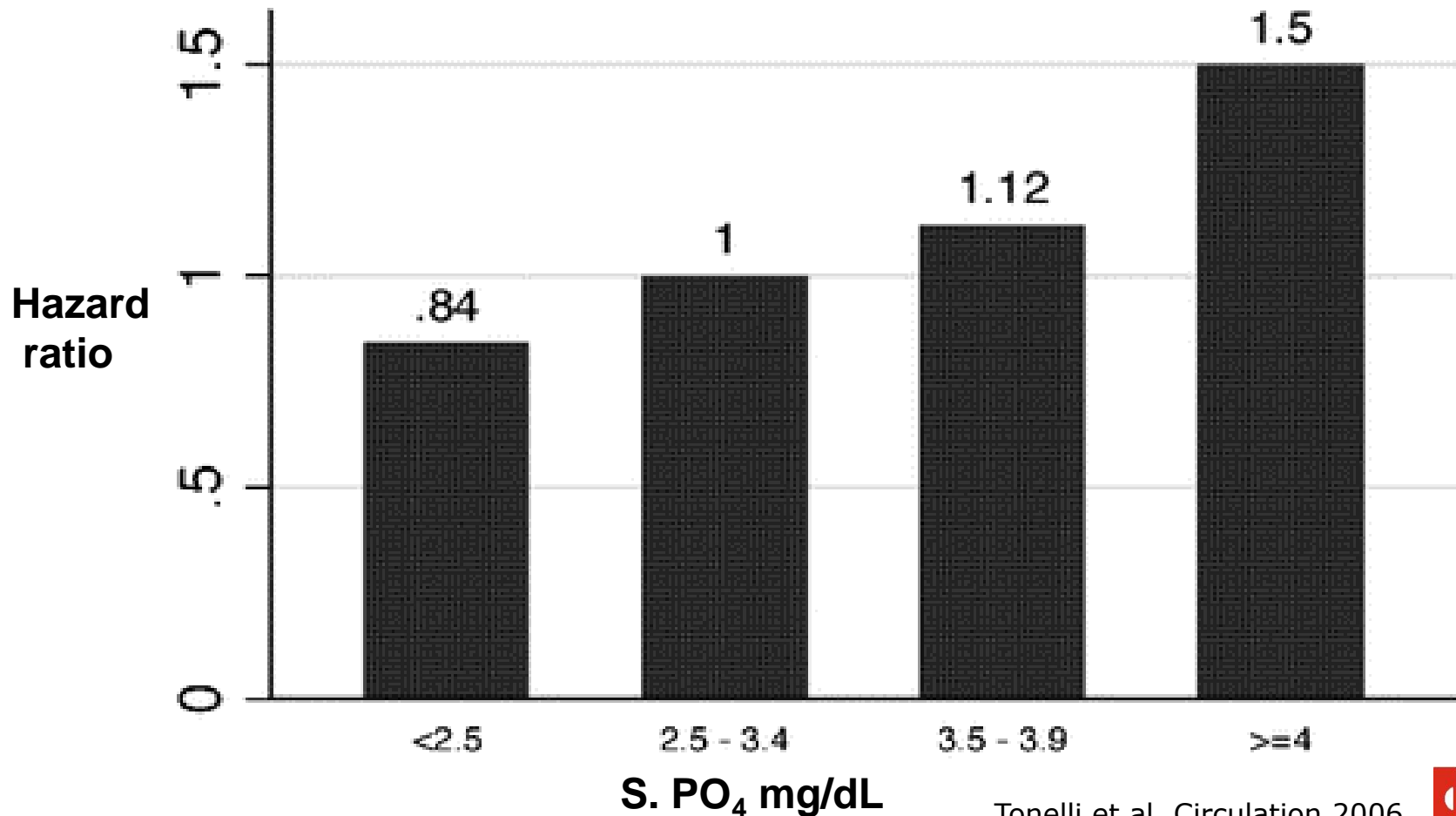
- Changes in metabolism of calcium, phosphate, parathyroid hormone and Vitamin D common when $\text{eGFR} \leq 60 \text{ mL/min/1.73m}^2$
- Leads to:
 - Bone disease
 - Soft tissue calcification (coronaries & valves)
 - Pruritus
 - Proximal myopathy
 - Premature death



Mortality and Phosphate

Increased PO_4 associated with increased mortality even in normal kidney function

Fatal or non-fatal MI



Mechanisms of Ca/PO₄ disturbance

- Phosphate retention with reduced GFR results in increased serum PO₄ and suppresses Vitamin D3 production
- Reduced Vitamin D3 leads to reduced Ca absorption and this plus high serum PO₄ leads to low serum Calcium
- Ca x PO₄ increases favouring tissue deposition
- PTH stimulated by low Ca, high PO₄ & low Vit D3

Clinical effects:

- Low serum Calcium
- High serum Phosphate
- High serum PTH
- Low Vitamin D3 [1,25 (OH)₂D₃ = calcitriol]

Changes with reducing GFR

GFR (mL/min/1.73 m ²)	CKD Stage	Changes in serum levels			
		1,25D	Phosphate	Calcium	PTH
60-90	2	↓	↔	↔	↑
30-59	3	↓↓	↑	↔	↑ 2-fold
15-30	4	↓↓	↑↑	↓	↑ 4-fold
<15	5	↓↓	↑↑↑	↓↓	↑ 8-fold

Assessment of Ca/PO₄ disturbance

(CKD mineral and bone disorder)

What to measure & how often

	Progressive CKD stage 3	CKD stage 4
Calcium & phosphate	6-12 months	3-6 months
PTH & alkaline phosphatase	Baseline	6-12 months
25-hydroxyvitamin D	Baseline	Baseline

Goals of therapy for mineral and bone disorder

Keep PO_4 in normal range (0.8-1.5 mmol/L)

Keep Ca in normal range (2.2-2.6 mmol/L)

Keep PTH 2-9 x upper limit of normal and avoid trends towards the extremes of this range

25-hydroxyvitamin D optimal levels may be >75 nmol/L

Therapy for Ca/PO_4 disturbance

⇒ Control sPO_4	Dietary restriction Phosphate binders (prevent uptake)
⇒ Control sCa	Adequate calcium uptake Calcitrol (increases uptake)
⇒ Control sPTH	Calcitrol (Cinacalcet) Parathyroidectomy

Referral is recommended if:

- **eGFR $<30\text{mL/min/1.73m}^2$** (stage 4 or 5 of any cause)
- **Persistent significant albuminuria** (urine ACR $\geq 30\text{mg/mmol}$)
- A **sustained decrease in eGFR** of 25% or more OR a sustained decrease in eGFR of 15mL/min/1.73m^2 , per year
- **Uncontrolled hypertension** with at least three anti-hypertensive agents



Clinical tip

Anyone with rapidly declining eGFR and/or signs of acute nephritis (oliguria, haematuria, acute hypertension and oedema) should be regarded as a medical emergency and referred with out delay

Recommended tests prior to referral

Current blood chemistry and haematology

Urine ACR and urine microscopy for red cell morphology and casts

Current and historical blood pressure

Urinary tract ultrasound

Unnecessary referral if:

- eGFR ≥ 30 mL/min/1.73m² is stable
- Urine ACR < 30mg/mmol (with no haematuria)
- Controlled blood pressure

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

Useful tips

- ✓ Pay attention to CVD risk reduction
- ✓ Consider discussing management issues with a nephrologist in cases where uncertainty regarding referral exists.
- ✗ Don't refer to a nephrologist if targets of therapy are achieved
- ✗ Spiral CT angiogram for hypertension is not recommended without specialty advice

Managing CKD

Progressive CKD is often associated with:

- Depression
- Macular degeneration
- Impaired cognitive function



Resources

Kidney Health Information Service

Free call information service
for people living with kidney
disease and their families



Conclusion

- Early CKD is common and can be primarily be managed in general practice
- Therapy overlaps significantly with best practice in CV risk reduction and diabetes care

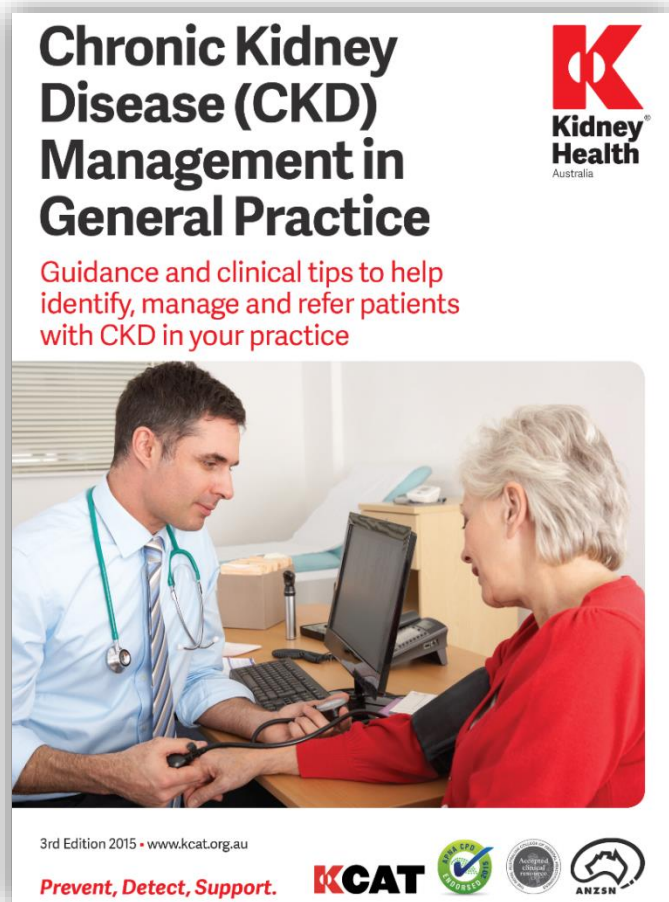
Key CKD management tasks

- ⇒ Lifestyle – Healthy diet & exercise, no smoking, weight control
- ⇒ Reduce CV risk
- ⇒ BP at target with ACEi or ARB and other agents as required
- ⇒ Reduce albuminuria with ACEi or ARB
- ⇒ Optimise haemoglobin, Ca/P and glycaemia

Resources

CKD management in General Practice

2015 guidelines handbook

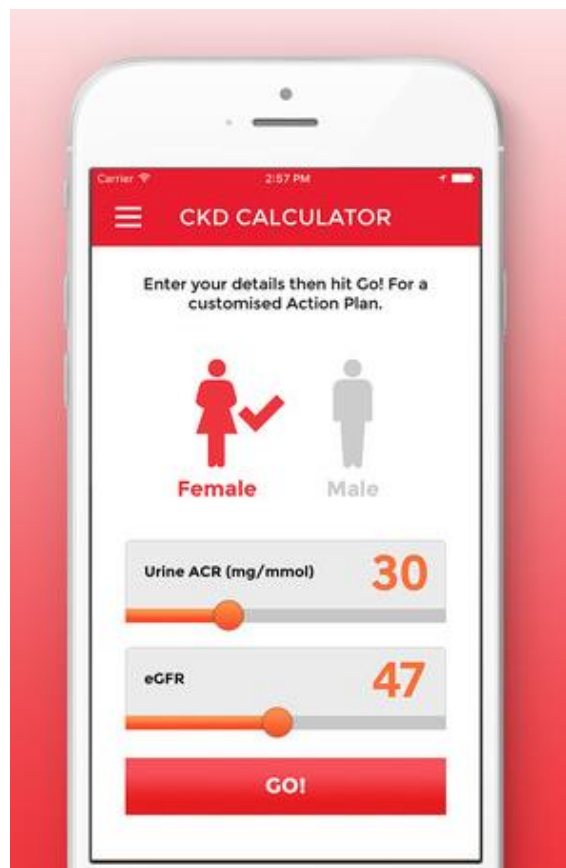


Available at

www.kidney.org.au/health-professionals

Resources

CKD-GO! Phone App



Rated a
'must have'
App
by Medical
Observer

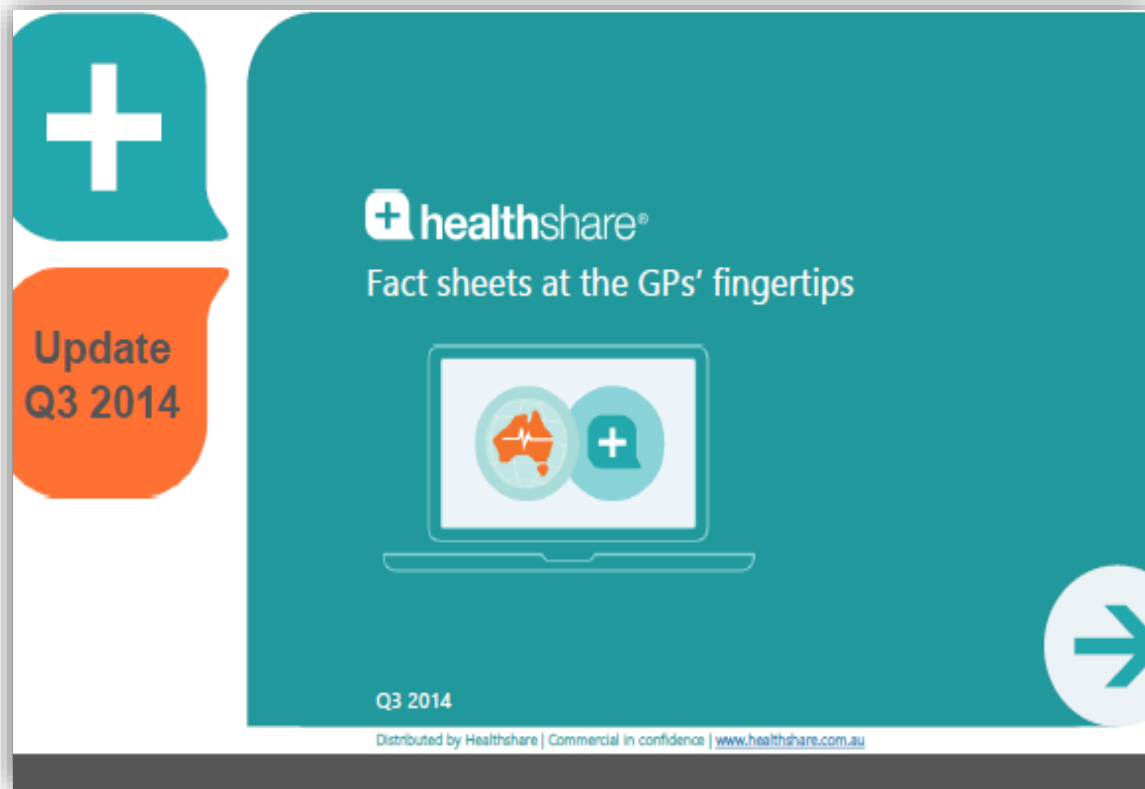
Available on
iTunes and Google
Play app stores

All the best bits of the
*'CKD Management in
General Practice'* handbook
now in a handy app!

Resources

Healthshare fact sheets

Chronic Kidney Disease fact sheets for patients. Available for Medical Director and Best Practice software



Factsheet

Urinary tract infections

How to look after your kidneys

Kidney Health Check up

GP only – Chronic Kidney Disease

All about Chronic Kidney Disease

Looking after yourself with CKD

Kidney stones

Kidney transplant

Peritoneal dialysis

Consent and kidney tests

Kidney health tests

Kidney cysts

Access for dialysis

Kidney cancer

Treating kidney disease

Homes haemodialysis

Haemodialysis

Life with a single kidney

All about GFR

Kidney Community...

KIDNEY COMMUNITY members receive a **monthly newsletter** from KHA allowing you to access:

- Information and invitations to KHA's education and support activities
- Updates on medical research in kidney disease
- Information on advocacy opportunities and government relations issues
- Information on community and corporate events held by Kidney Health Australia

**To join the kidney community,
email
community@kidney.org.au**

Questions?

**Thankyou for participating
in this workshop**

***Please complete your evaluation
form before leaving.***