



Chronic Kidney Disease



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Become a member

**We now have almost
8,000 members**

Membership is free

www.pccsuk.org

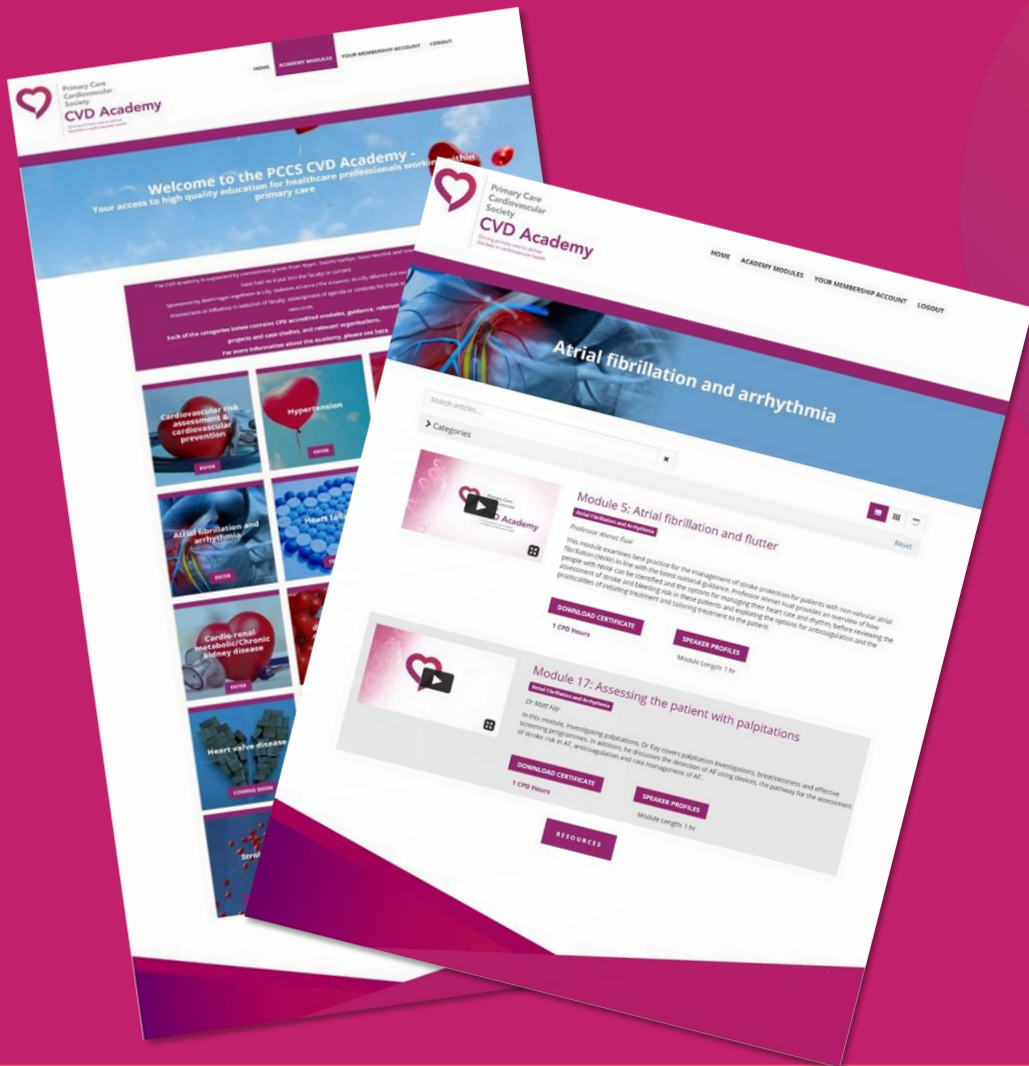




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CVD Academy

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PCCS CVD Academy



Free to all PCCS members



A series of 20+ modules containing, video, resources, guidelines across key CVD topics



CPD accredited with downloadable certificates



Accessible via the PCCS website



Access via activating your PCCS account

Quality Improvement Programmes

Our PCCS QI programmes aim to bring together the key components of delivering high quality cardiovascular and kidney care across general practice.

Current QI topics include:

Chronic Kidney
Disease

Lipids

Heart failure

COVID-19

Triglycerides

Each programme includes:

Prevention and
Diagnosis

Coding
and Searches

Treatment and
Management

Practical Tips

Patient
Identification

End of life



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Check them out at www.PCCSUK.org



Podcasts available on Spotify and Apple



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On the menu



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Healthy kidneys

Who's at risk?

Failing kidneys

Making the diagnosis

Treatment made simple

Lifestyle interventions

When to refer





CKD – what needs to happen?



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- First – try to prevent the condition
- Second – diagnose early
- Third – try to slow deterioration
- Fourth – recognise and treat complications





The healthy kidney



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R – retaining glucose, protein, some vitamins and minerals



E – eliminating waste including medication



N – normalising BP, electrolytes, PH, fluid levels



A – activating the renin angiotensin aldosterone system



L – linking into bone and blood health (calcium, vitamin D, erythropoietin)



Key 'at risk' groups



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We are already seeing these people for reviews of their long-term condition:

People with diabetes – around 40% will have CKD

People with hypertension – around 10-20% will have CKD

People with heart failure – around 50% will have CKD

People with cardiovascular disease – CKD is a cardiovascular disease and risk factor for CVD



NICE recommends testing for CKD in these group



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- Diabetes
- Hypertension
- Previous episode of acute kidney injury
- Cardiovascular disease
- Gout
- Structural renal tract disease, recurrent renal calculi or prostatic hypertrophy
- Autoimmune diseases with potential renal involvement





Making the diagnosis



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Diagnosis



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- **Measure the eGFR at least 3 times over at least 3 months**
- 1st – first measurement below 60ml/min?
- 2nd – repeat within 1-2 weeks to check for acute kidney injury
- 3rd – no sooner than 3 months from sample 1





Albumin creatinine ratio - ACR



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Albuminuria indicates kidney damage – the higher the level, the greater the damage and risk



Risk – of a poor renal and CV outcome



Often the first 'red flag'



By the time eGFR drops below 60ml/min nephron mass can be down to 20% - creatinine starts to rise when nephron mass is down 50%+



A raised ACR (3mg/mmol+) may be seen with a 'normal' eGFR but is associated with a 1.5 x increased risk of heart failure and cardiovascular mortality



Albumin Creatinine Ratio (ACR)



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- NICE says:
- If ACR is 3mg/mmol or more, repeat in 3 months
- If it's 3mg/mmol or more on the repeat test, the diagnosis is CKD with albuminuria
- Check for haematuria
- An ACR of 30mg/mmol with haematuria needs referral





Meet Anthony



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- 67 years old
- Just retired from his post as a head teacher
- H/p type 2 diabetes and hypertension
- He's being treated with metformin 2g daily and amlodipine 5mg



Sara



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- Sara is 59 years old and has just moved in with her daughter, Maryam, after recently being widowed
- She has a history of hypertension, diagnosed 5 years ago, and chronic kidney disease, diagnosed 2 years ago
- She is on ramipril 2.5mg





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Let's think about Sara



- Her latest renal function tests show an eGFR of 49ml/min and an ACR of 2.5mg/mmol
- Her average home BP is 134/76 mmHg
- She is on ramipril 2.5mg
- Where is she on the KDIGO chart?



Prognosis of CKD by GFR and Albuminuria Categories

				Albuminuria categories		
				Description and range		
				A1	A2	A3
				Normal to mildly increased <30 mg/g <3 mg/mmol	Moderately increased 30-299 mg/g 3-29 mg/mmol	Severely increased ≥300 mg/g ≥30 mg/mmol
GFR categories (ml/min/1.73 m ²) Description and range	G1	Normal or high	≥90	Green	Yellow	Orange
	G2	Mildly decreased	60-90	Green	Yellow	Orange
	G3a	Mildly to moderately decreased	45-59	Yellow	Orange	Red
	G3b	Moderately to severely decreased	30-44	Orange	Red	Red
	G4	Severely decreased	15-29	Red	Red	Red
	G5	Kidney failure	<15	Red	Red	Red
Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red, very high risk. KDIGO 2012						





Anthony



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- Anthony is 67 years old and has a history of type 2 diabetes and hypertension
- He's being treated with metformin 2g daily and amlodipine 5mg
- His average home BP is 142/79 mmHg
- His latest eGFR is 58ml/min and his ACR is 3.4mg/mmol



Anthony

Importantly, we need to confirm Anthony's renal status over the next 3 months

If he stays in the same zone, we can diagnose CKD

Anthony's eGFR is better than Sara's (58 vs 49) BUT...

His ACR is worse than Sara's (3.4 vs 2.5)



Albuminuria categories

Description and range

Prognosis of CKD by GFR and Albuminuria Categories				Albuminuria categories		
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GFR categories (ml/min/1.73 m ²) Description and range	G1	Normal or high	≥90			
	G2	Mildly decreased	60-90		★	
	G3a	Mildly to moderately decreased	45-59			
	G3b	Moderately to severely decreased	30-44			
	G4	Severely decreased	15-29			
	G5	Kidney failure	<15			

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

KDIGO 2012



Staging Anthony and Sara



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Sara is CKD class G3A1 while Anthony is G3A2

Sara's prognosis sits in the yellow zone – moderately increased risk

Anthony sits in the orange zone – high risk

Risk relates to prognosis of CKD but also refers to CVD too



Lifestyle advice



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- Smoking cessation
- Weight management and healthy eating
- Alcohol
- Salt
- Immunisations
- Sick day rules
- Avoid nephrotoxic drugs, including those bought over the counter





Statins



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- NICE says these are indicated for everyone with CKD, with no need to risk assess
- QRisk calculators do include CKD
- Renal impairment will slightly increase the risk of myalgia and rhabdomyolysis
- If eGFR <30ml/min, consider getting specialist input before increasing doses of statins

Welcome to the QRISK®3-2017 risk calculator

This calculator is only valid if you do not already have a diagnosis

About you

Age (25-84):

Sex: ☒ Male ☐ Female

Ethnicity:

UK postcode: leave blank if unknown

Postcode:

Your results

Your risk of having a heart attack or stroke within the next 10 years is:

In other words, in the next 10 years, you are likely to have a heart attack or stroke like 22.5% of people with the same risk factors as you.

Clinical information

Smoking status:

Diabetes status:

Angina or heart attack in a 1st degree relative <60? ☐

Chronic kidney disease (stage 3, 4, or 5)? ☐

Atrial fibrillation? ☒

On blood pressure treatment? ☐

Do you have migraines? ☒

Rheumatoid arthritis? ☐

Systemic lupus erythematosus (SLE)? ☐

Severe mental illness? ☐

On atypical antipsychotic medication? ☐

Are you on regular steroid tablets? ☒

A diagnosis of or treatment for erectile dysfunction? ☒

Leave blank if unknown

Total cholesterol: HDL cholesterol ratio:

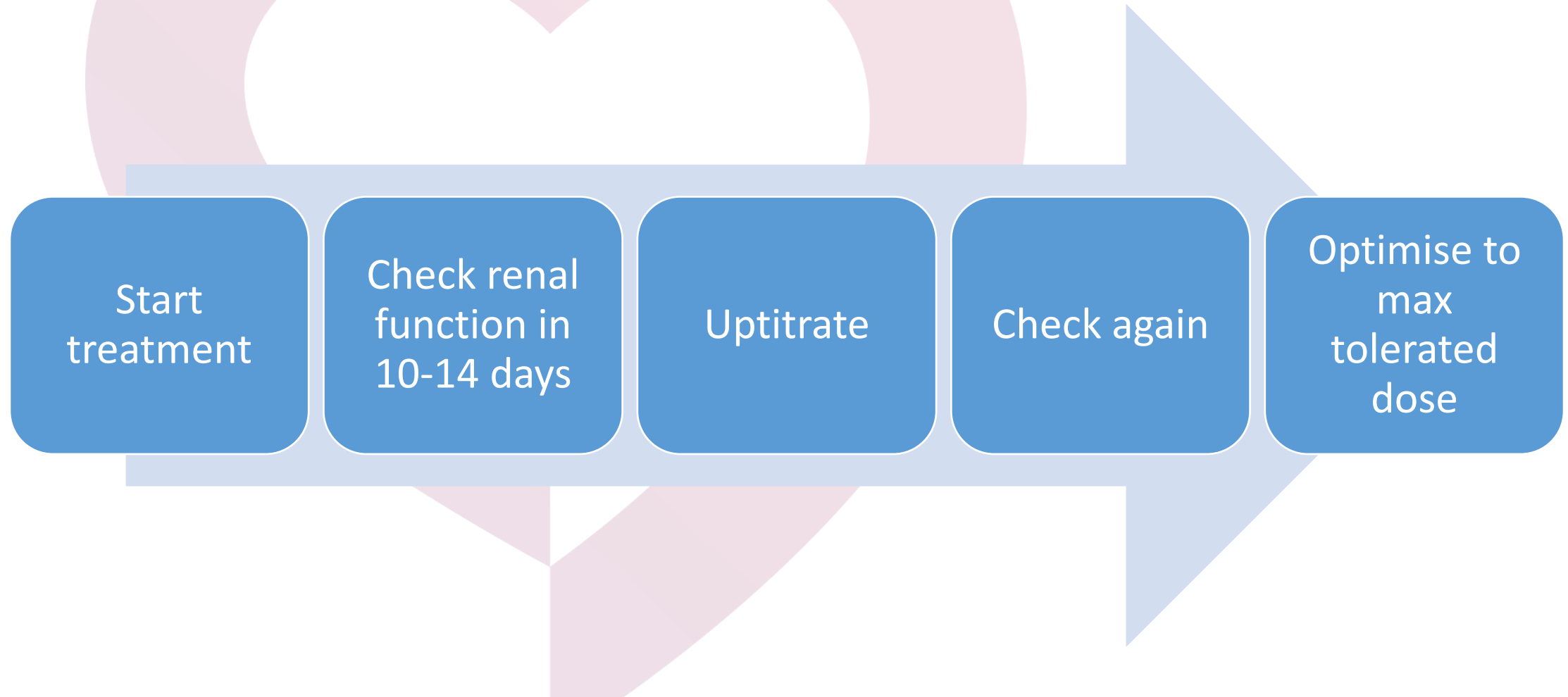
Systolic blood pressure (mm Hg):

Standard deviation of at least two most recent systolic blood pressure readings (mm Hg):

Figure: A large red 'X' is drawn over the QRISK calculator interface, indicating that the calculator is not valid for use in this context.



RAAS inhibition: ACEi or ARB





SGLT2i



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In anyone
with CKD and
diabetes or
heart failure

After
ACE/ARB
optimisation
if ACR is
raised



CKD and type 2 diabetes



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The impact on glycaemic control maybe be much less if the eGFR is <45ml/min

The cardiorenal benefits remain

NICE (NG28) now recommends an SGLT2i in anyone with T2D



Optimise her BP management



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Q – will the RAASi/SGLT2i have achieved this?



Q – where next if not?



BP optimisation in CKD



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- ESC/KDIGO recommends:
- Aim for a BP of $<140/90$ mmHg initially
- Ideally aim for 120-130/70-80mmHg



Alphabet of CKD



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ACR

BP
(ACE/ARB)

Cholesterol

Dapagliflozin

eGFR

Finerenone
(diabetes)



Back to Anthony



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- Type 2 diabetes
- Hypertension – latest average home BP reading 132/78mmHg
- HbA1c 52mmol/mol
- eGFR 53ml/min and ACR 3.2mg/mmol
- Total cholesterol 4.2mmol/L and HDL-C 1.0mmol/L
- Currently on metformin 2g and amlodipine 5mg





Sara



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- Sara has hypertension and CKD G3aA1
- Her latest renal function tests show an eGFR of 49ml/min and an ACR of 2.5mg/mmol
- Her average home BP is 134/76mmHg
- Total cholesterol 5.3mmol/L and HDL-C 1.3mmol/L
- She is on ramipril 2.5mg
- Where next?





Kidney Failure Risk Equation

<https://kidneyfailurerisk.co.uk/>



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URINE

+



SEX

+



AGE

+

GFR

GLOMERULAR
FILTRATION RATE

=

THE PROJECTED RISK OF KIDNEY FAILURE



SADMAN



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- SGLT2i
- ACEi
- Diuretics
- Metformin
- ARBs
- NSAIDs



Frequency of monitoring per year

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**Guide to Frequency of Monitoring
(number of times per year) by
GFR and Albuminuria Category**

				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30–300 mg/g 3–30 mg/mmol	>300 mg/g >30mg/mmol
GFR categories (ml/min/1.73 m ²) Description and range	G1	Normal or high	≥90	1 if CKD	1	2
	G2	Mildly decreased	60–89	1 if CKD	1	2
	G3a	Mildly to moderately decreased	45–59	1	2	3
	G3b	Moderately to severely decreased	30–44	2	3	3
	G4	Severely decreased	15–29	3	3	4+
	G5	Kidney failure	<15	4+	4+	4+



Kidney Care UK:

<https://kidneycareuk.org/>



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News

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Help and support ▾

Get involved ▾

About us ▾

Health professionals ▾



Donate

We are the UK's leading kidney patient support charity



We provide practical, emotional and financial support to kidney patients and their families.



We campaign at a national and government level to improve kidney health and care services.



We fund patient-centred projects to help improve kidney care services throughout the UK.

When to refer



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Consider if eGFR $<30\text{ml/min}$

Accelerated loss of eGFR of 25% or more and a change in category within 12 months

Sustained decrease in eGFR 15ml/min per year

ACR $70\text{mg/mmol}+$

ACR 30mg/mmol with haematuria (NB Isolated persistent haematuria needs a 2-week referral)

5-year risk of needing renal replacement therapy $>5\%$



Complications: A WET BED

- Acidosis and AKI
- Water retention
- Electrolyte imbalance
- Toxin accumulation
- Bone disease
- EPO deficiency – anaemia of CKD
- Dyslipidaemia and CVD





So! Let's ROAR about CKD



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- Recognise it
- Optimise treatment
- Address CVD risk
- Refer