Chronic kidney disease

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Overview

- What is chronic kidney disease and why is it a problem?
- How do we detect chronic kidney disease?
- How can nurses help prevent the disease progressing and best support our patients?

What is chronic kidney disease and why is it a problem?

Chronic kidney disease (CKD)

“Abnormalities of kidney structure or function, present for a minimum of 3 months”

Classification based on

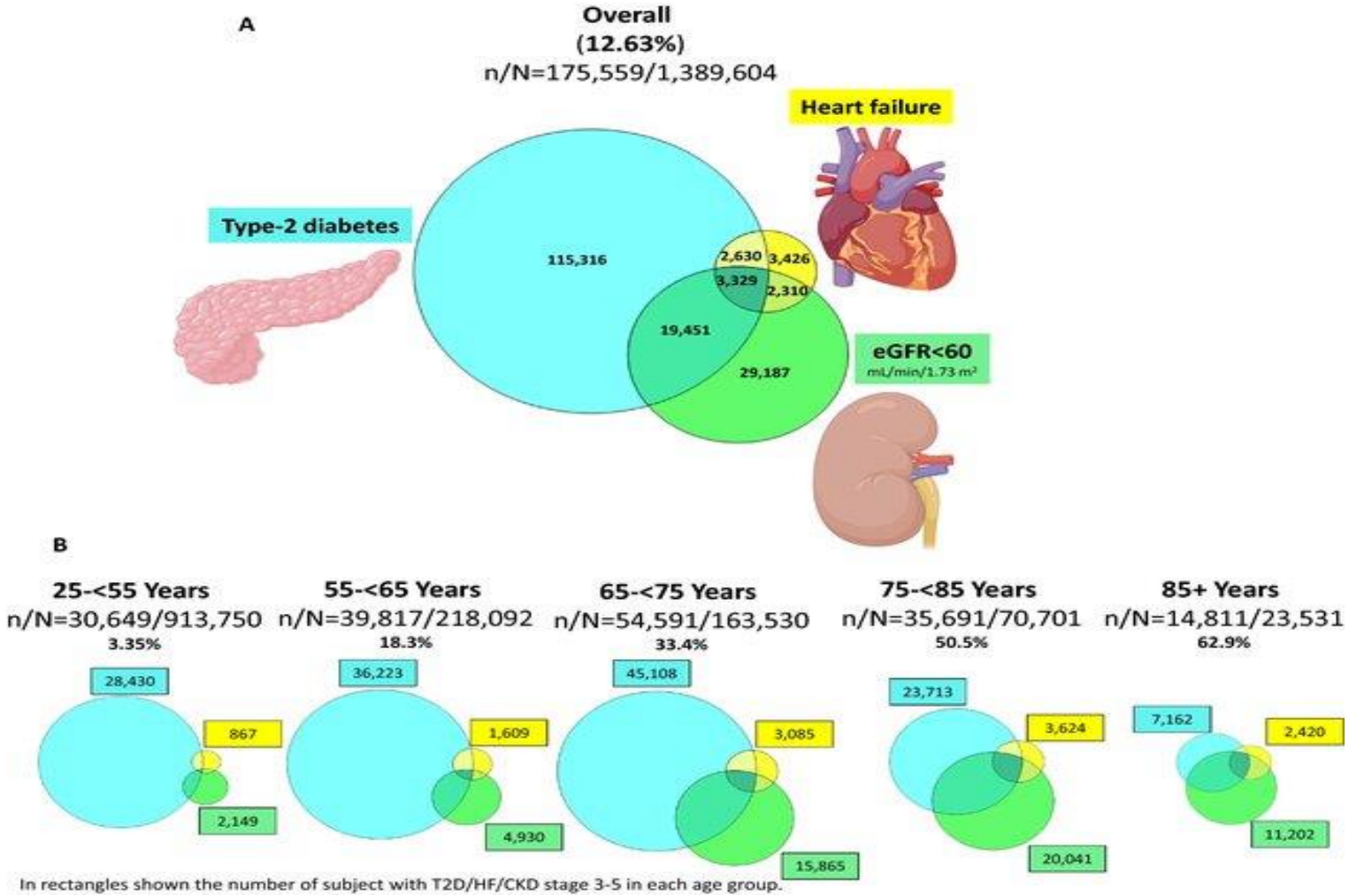
- Cause
- GFR category (under 60)
- Albuminuria category

KDIGO CKD Guideline 2024

Causes of CKD

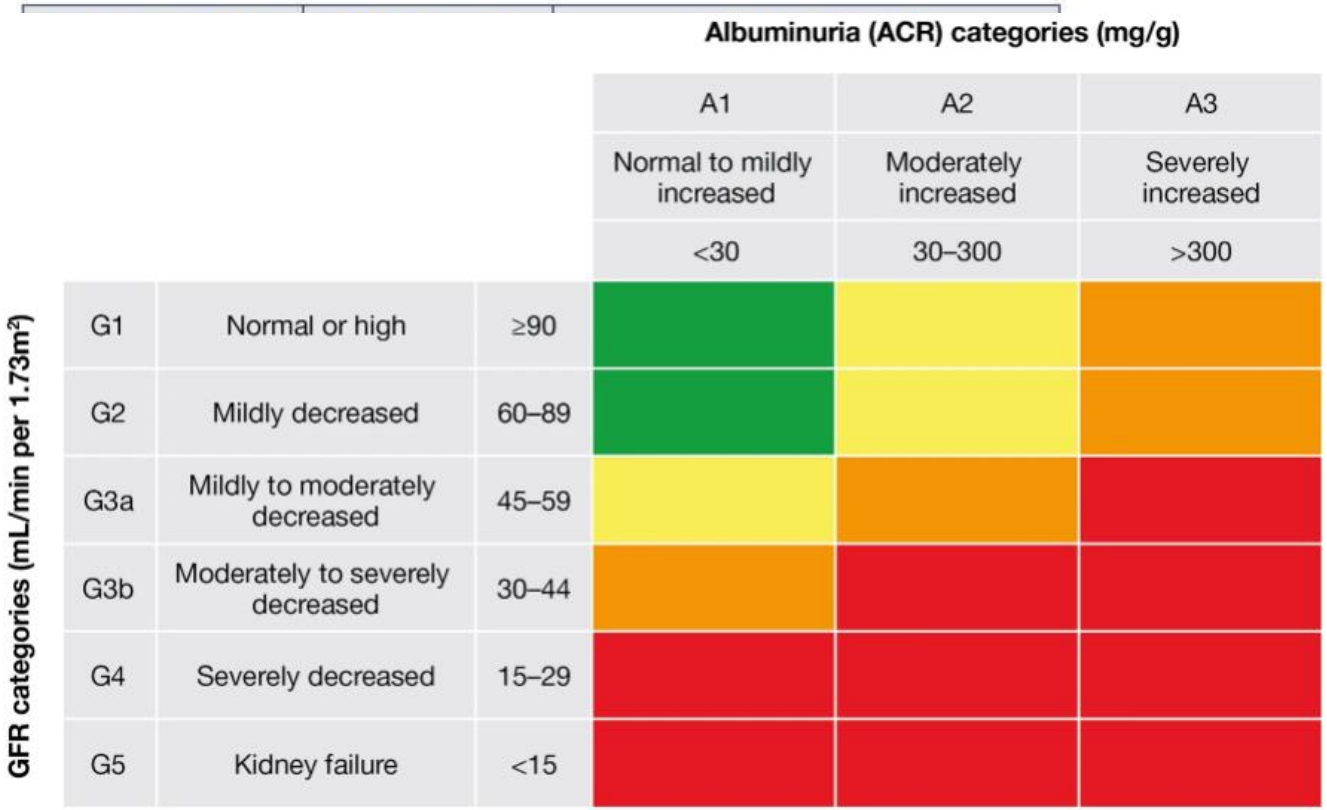
- Diabetes
- Hypertension
- Glomerulonephritis
- Obstruction
- Medications
- Genetic conditions such as polycystic kidneys
- Recurrent infections
- Auto immune conditions

Should we be treating multiple long term conditions in combination?



Epidemiology of the diabetes-cardio-renal spectrum: a cross-sectional report of 1.4 million adults. Schechter et al 2022, Cardiovascular Diabetology 21, 104.

Classification of CKD



GFR categories (mL/min per 1.73m²)				Albuminuria (ACR) categories (mg/g)		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30	30–300	>300
G1	Normal or high	≥90				
G2	Mildly decreased	60–89				
G3a	Mildly to moderately decreased	45–59				
G3b	Moderately to severely decreased	30–44				
G4	Severely decreased	15–29				
G5	Kidney failure	<15				

End stage treatment (up to 2 %)

- Transplant (live or deceased)
- Dialysis (haemodialysis or peritoneal dialysis)
- Conservative care
- But….most people don’t reach end stage due to cardiovascular mortality

CKD is an independent risk factor for….

- Heart failure
- MI
- CVA / TIA
- Peripheral vascular disease
- Premature death

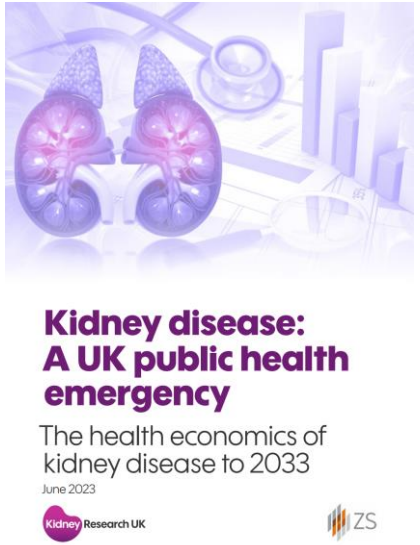
(and more so than diabetes alone)

Does CKD affect everyone equally?

- People from lower socioeconomic groups more likely to progress faster towards kidney failure
- People from South Asian and Black backgrounds are 3-5 more times likely to start dialysis than people from White backgrounds

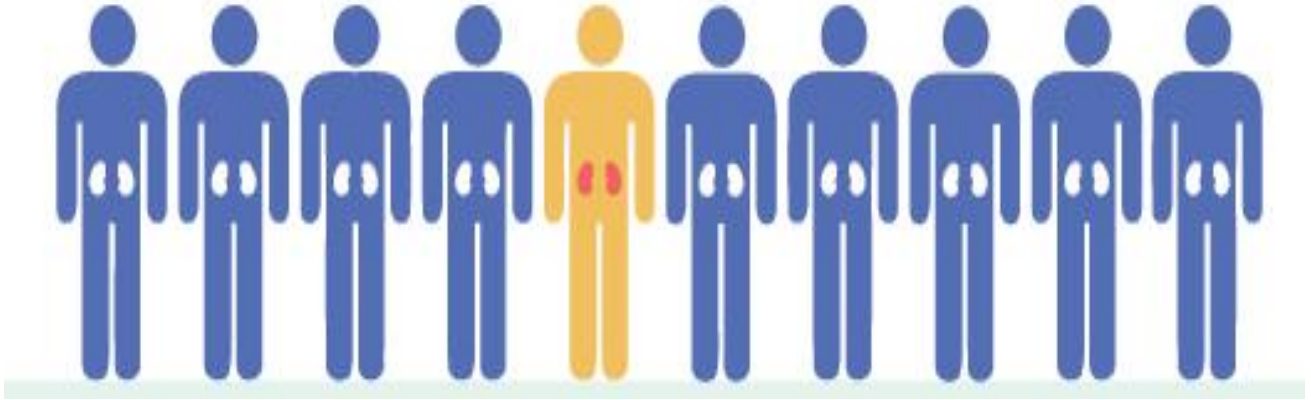
Health Inequalities in Kidney Care (kingshealthpartners.org)

Prevalence of CKD



- Estimated to affect 10% of the population
- Costs UK economy £7 billion a year (£6.4 billion direct costs to NHS)
- Prevalence increasingly dramatically as the population ages and cases of diabetes, hypertension, obesity and heart disease increase
- Predicted to be the 5th highest cause of premature death by 2040
- Estimated that over 500,000 people have CKD but are not coded

Chronic Kidney disease



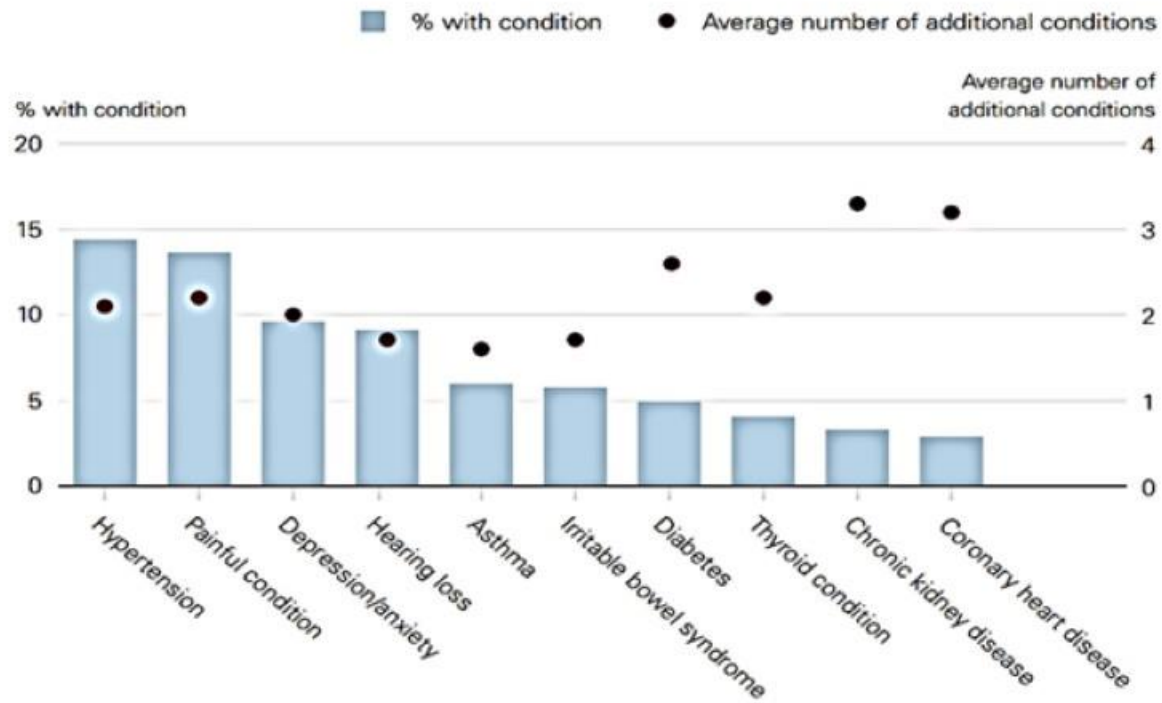
Silent disease

CKD is rarely in isolation

9 out of 10 people with CKD have other long term conditions adding to the complexity

- Hypertension
- Diabetes
- Chronic pain
- Depression
- Cancer
- Heart failure
- Heart attacks /angina
- Lung disease (including asthma)
- Cerebrovascular disease
- Atrial fibrillation

Implications of having CKD - multimorbidity

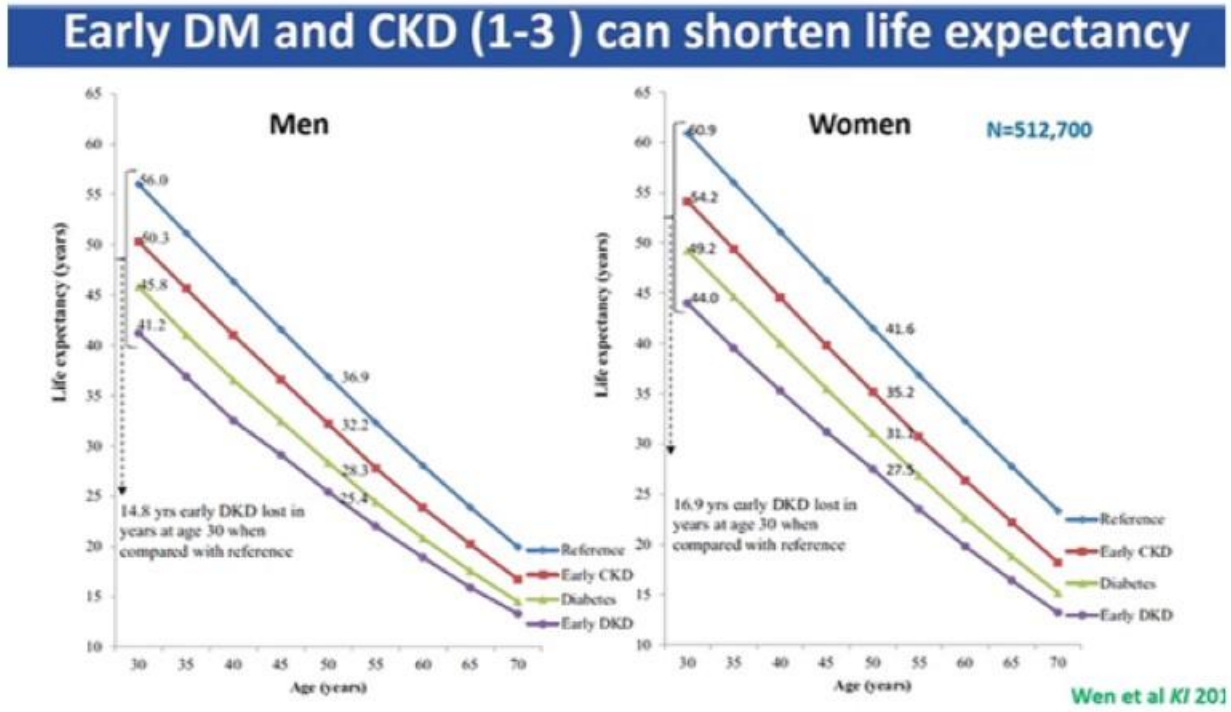


[Health Foundation (2018): Common conditions and average number of additional conditions]

NICE audit 2017 for every 100 patients with CKD per year there are

- 38 unplanned hospital admissions
- 7 events of AKI
- 2 ICU admissions
- 7 deaths
- 6 cardio vascular events

Why is identification of DKD important?



Yorkshire and the Humber Clinical Networks

YORKSHIRE & HUMBER
Kidney Network Kidney Transplant Workstream

Hannah Beba et al 2024

How do we detect chronic kidney disease?

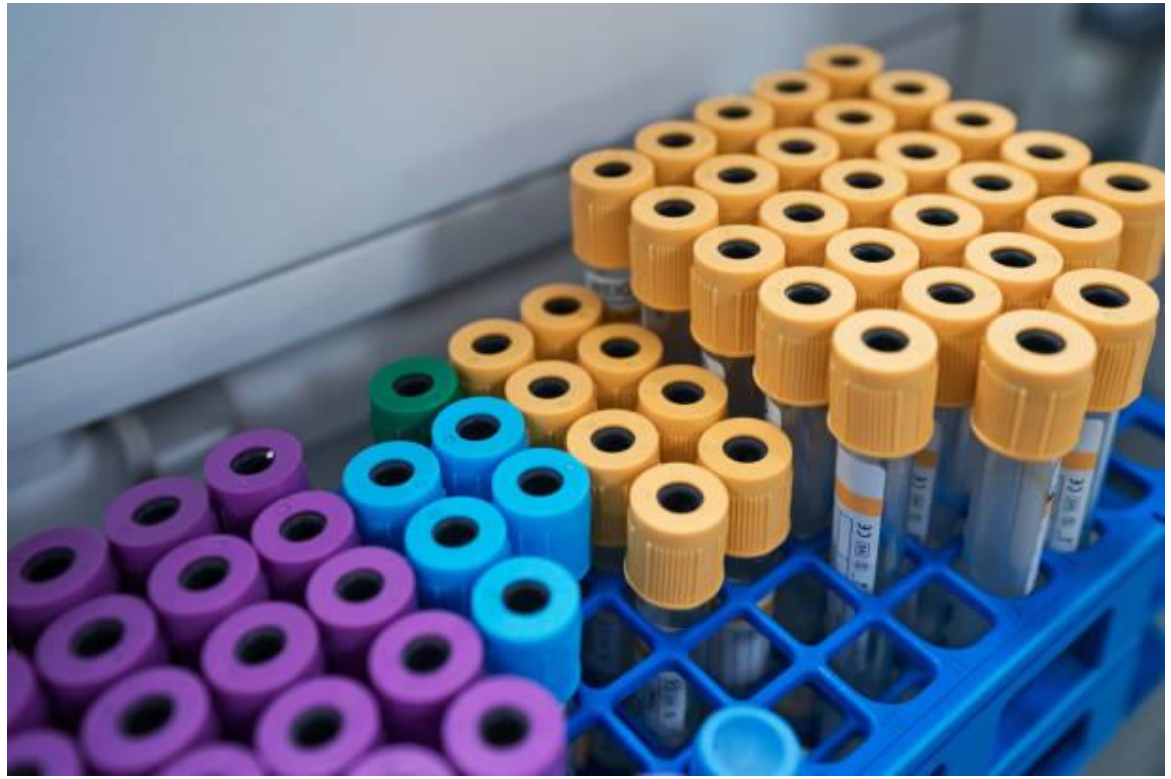
MORE THAN 1 MILLION PEOPLE IN THE UK HAVE KIDNEY DISEASE BUT DON'T KNOW IT

Screening for CKD is vital

- Diabetes
- Hypertension
- Previous AKI (monitor for 3 years even if function back to baseline)
- Cardiovascular disease (ischaemic heart disease, chronic heart failure, peripheral vascular disease or cerebral vascular disease)
- Structural renal tract disease, recurrent renal calculi or prostatic hypertrophy
- Family history of end-stage kidney disease (GFR category G5) or hereditary kidney disease
- Gout
- Incidental detection of haematuria or proteinuria
- On nephrotoxic agents such as Lithium, Calcineurin Inhibitors, Sulphasalazine, long term chronic use of NSAIDs

(NICE 2021)

CKD screening – blood AND urine



Stages of CKD

Classification of chronic kidney disease using GFR and ACR categories

GFR and ACR categories and risk of adverse outcomes			ACR categories (mg/mmol), description and range		
			<3 Normal to mildly increased	3–30 Moderately increased	>30 Severely increased
			A1	A2	A3
GFR categories (ml/min/1.73m^2), description and range	≥90 Normal and high	G1	No CKD in the absence of markers of kidney damage		
	60–89 Mild reduction related to normal range for a young adult	G2			
	45–59 Mild–moderate reduction	G3a[1]			
	30–44 Moderate–severe reduction	G3b			
	15–29 Severe reduction	G4			
	<15 Kidney failure	G5			

Increasing risk

Increasing risk

[1] Consider using eGFRcystatinC for people with CKD G3aA1 (see recommendations 1.1.14 and 1.1.15)

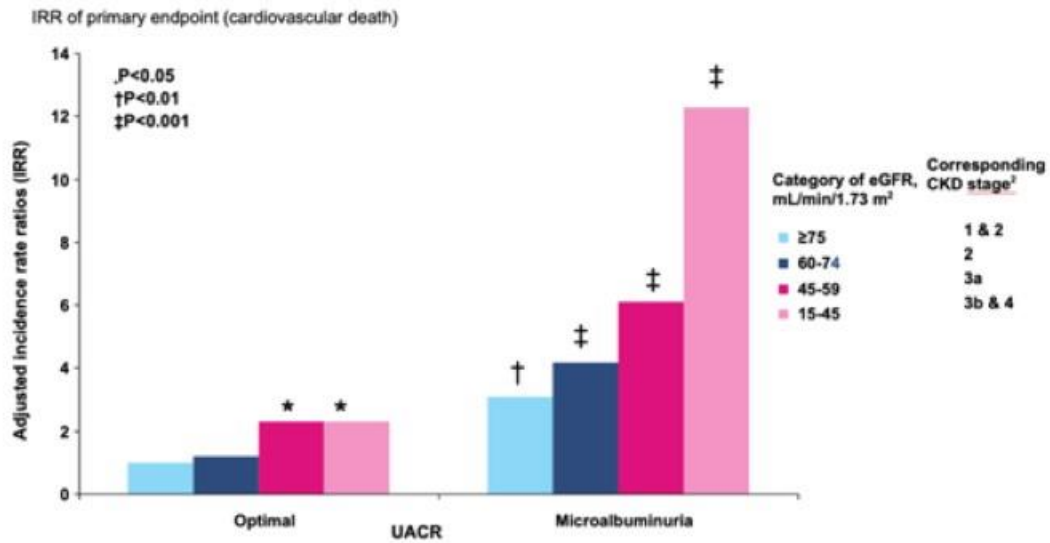
Abbreviations: ACR, albumin:creatinine ratio; CKD, chronic kidney disease; GFR, glomerular filtration rate

Adapted with permission from Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group (2013) KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. Kidney International (Suppl. 3): 1–150

What does screening involve?

Albuminuria is an independent risk factor for progression to end stage kidney disease and cardiovascular mortality, at any eGFR.

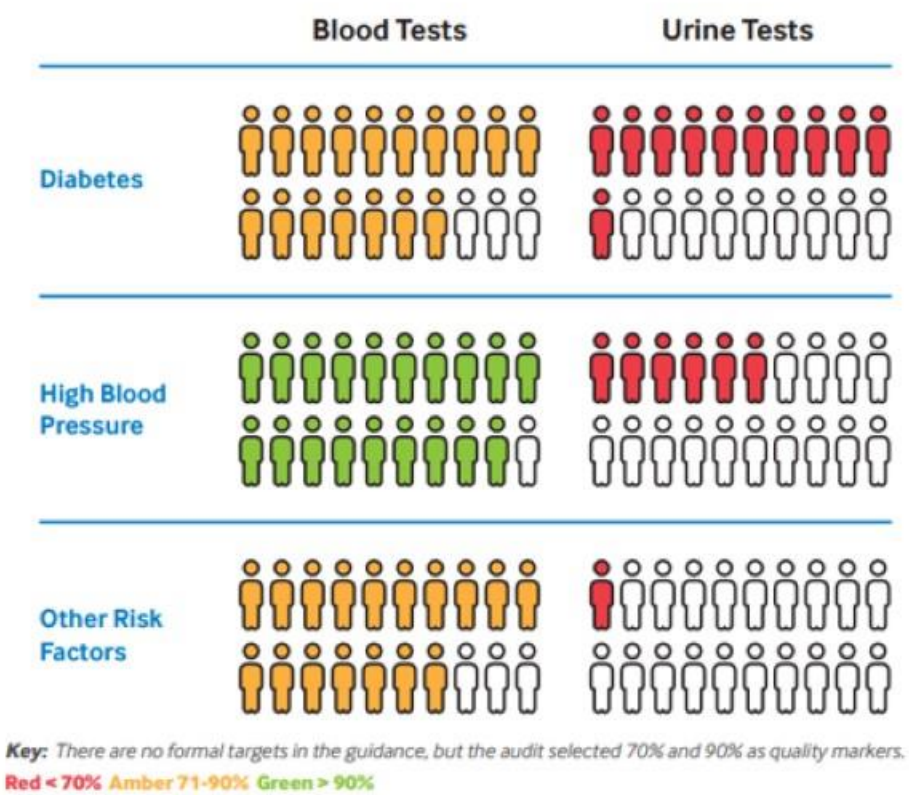
uACR is therefore **essential** in combination with eGFR to diagnose CKD in high risk patients.



1. Adapted from Hallan et al. *Archives Internal Medicine* 2007 167;22;2490-2496
2. NICE Management of CKD: *NICE*

Screening for CKD

The charts show the proportion of patients with different risk factors for CKD who have had blood and urine tests.



National Chronic Kidney Disease Audit // National Report: Part 1 January 2017

KIDNEY FAILURE RISK EQUATION

Using the patient's Urine, Sex, Age and eGFR, the kidney failure risk equation provides the 2 and 5 year probability of treated kidney failure for a potential patient with CKD stage 3a to 5.

URINE

+

SEX

+

AGE

+ EGFR =

ESTIMATED GLOMERULAR FILTRATION RATE

THE PROJECTED RISK OF KIDNEY FAILURE

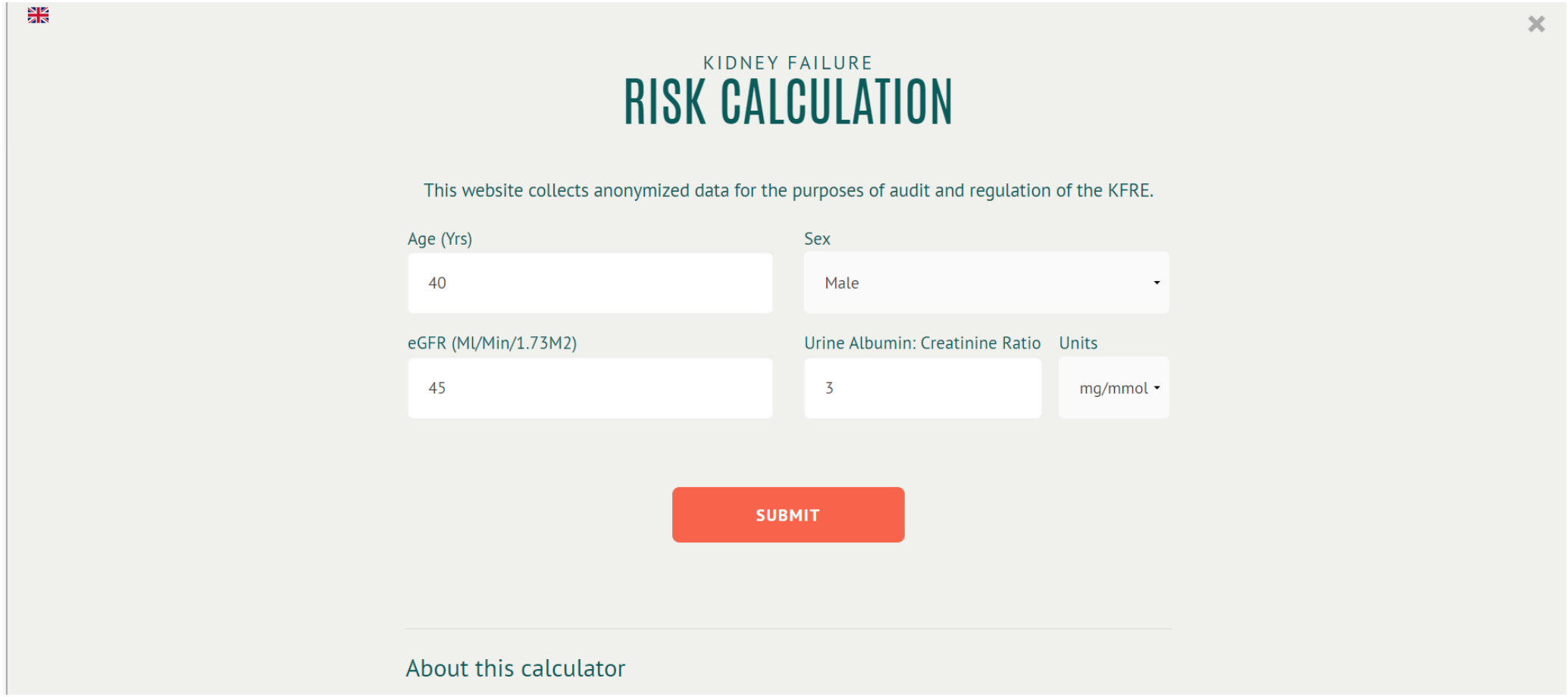
Kidney Failure Risk Equation (KFRE)

- Available as a lab request or at www.kidneyfailurerisk.co.uk
- Validated to a UK population (use UK website)
- Predicts a person's 5 year risk of needing renal replacement therapy – NICE recommends Nephrology referral if over 5%
- Not suitable for use in AKI or GFR >60ml/min

Kidney Failure Risk Equation (KFRE)

- Implemented into EMIS and SystmOne
- On ICE under ‘CKD monitoring’
- Kidney Failure Risk Equation & Renal Tools Launch on Vimeo
- Need to receive blood and urine ideally within 7 days
- Can help with a tailored management plan
- Positive framing

KRFE – Example 1



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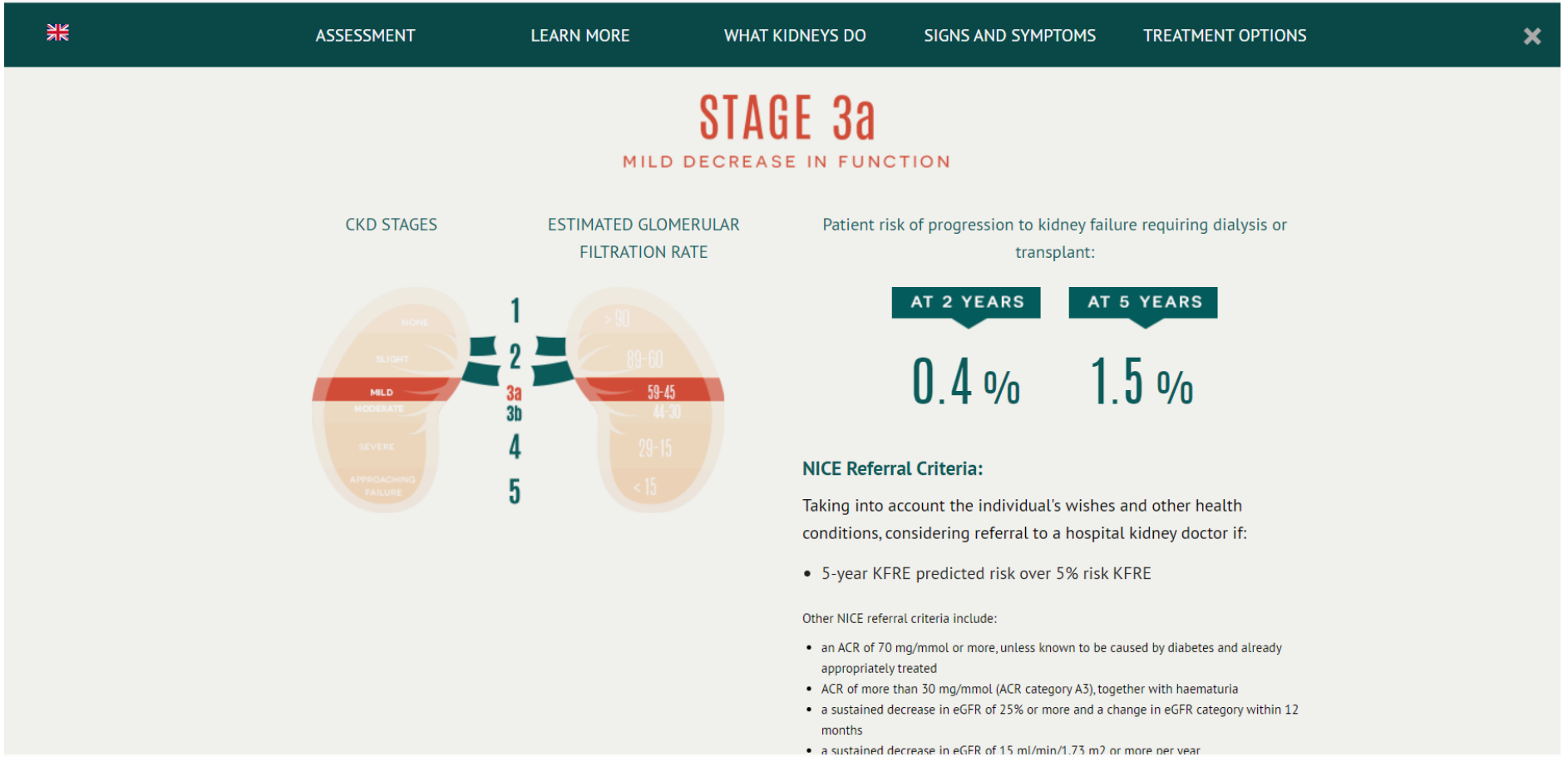
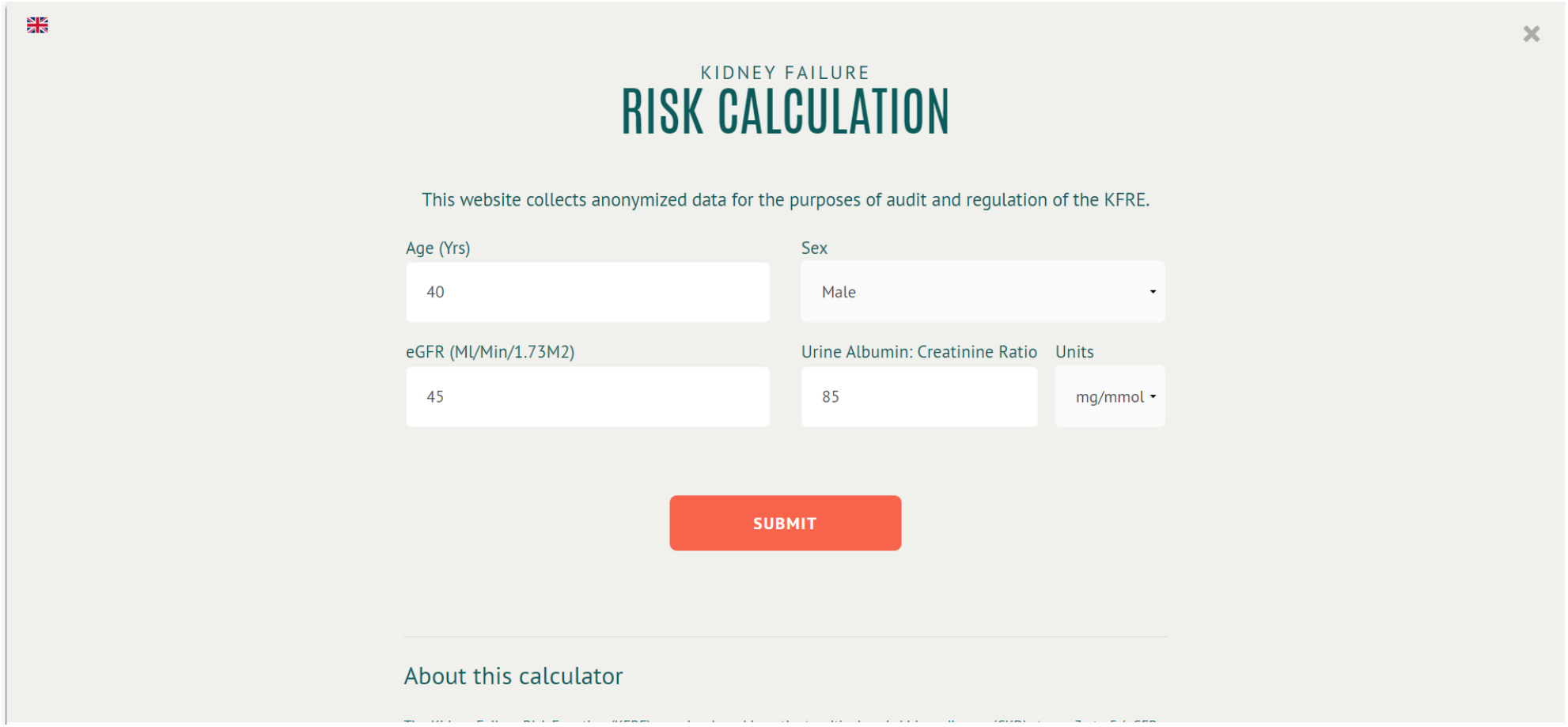


KFRE – Example 2

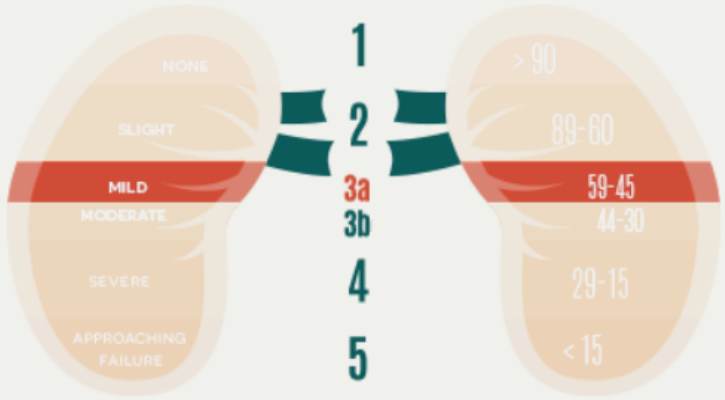


KRFE – Example 2

STAGE 3a

MILD DECREASE IN FUNCTION

CKD STAGES	ESTIMATED GLOMERULAR FILTRATION RATE
1	> 90
2	89-60
3a	59-45
3b	44-30
4	29-15
5	< 15



Patient risk of progression to kidney failure requiring dialysis or transplant:

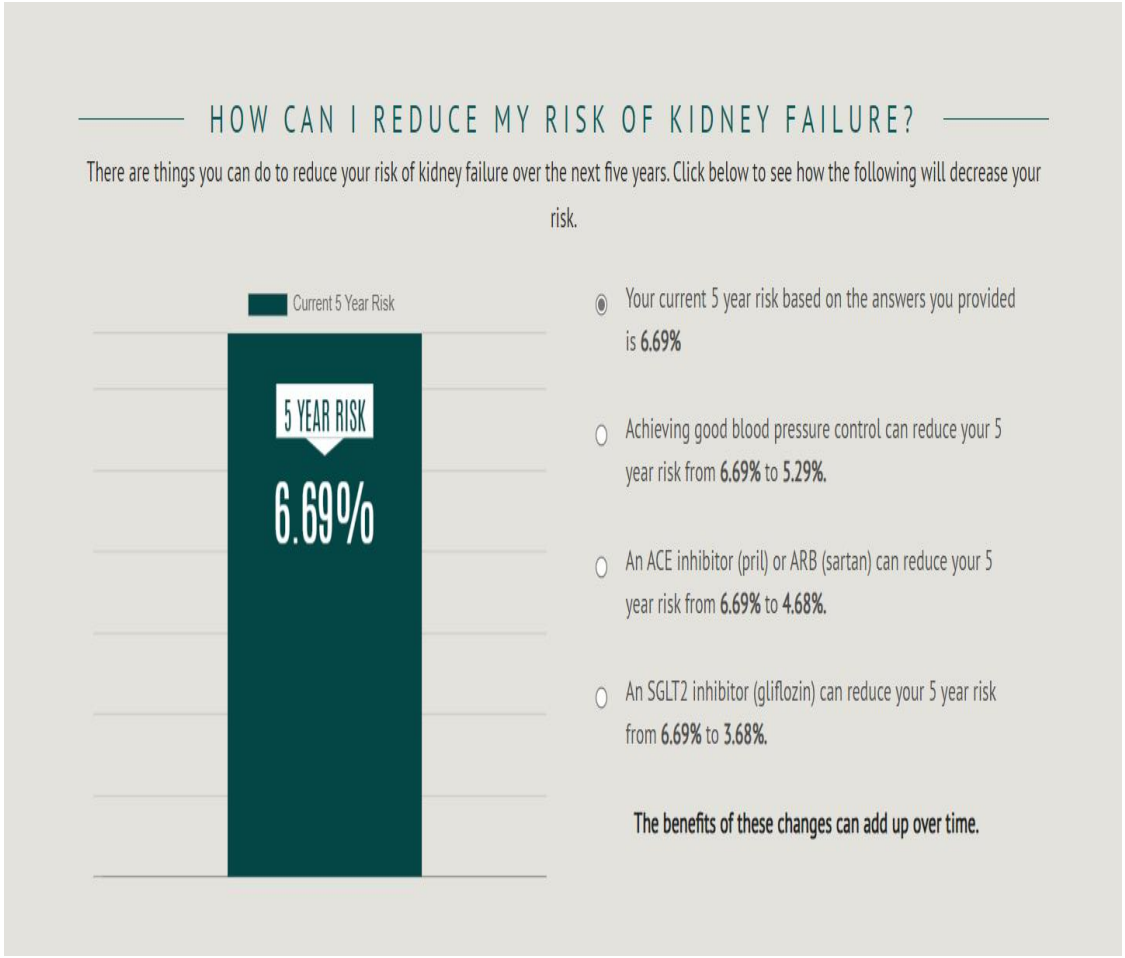
AT 2 YEARS	AT 5 YEARS
1.9 %	6.7 %

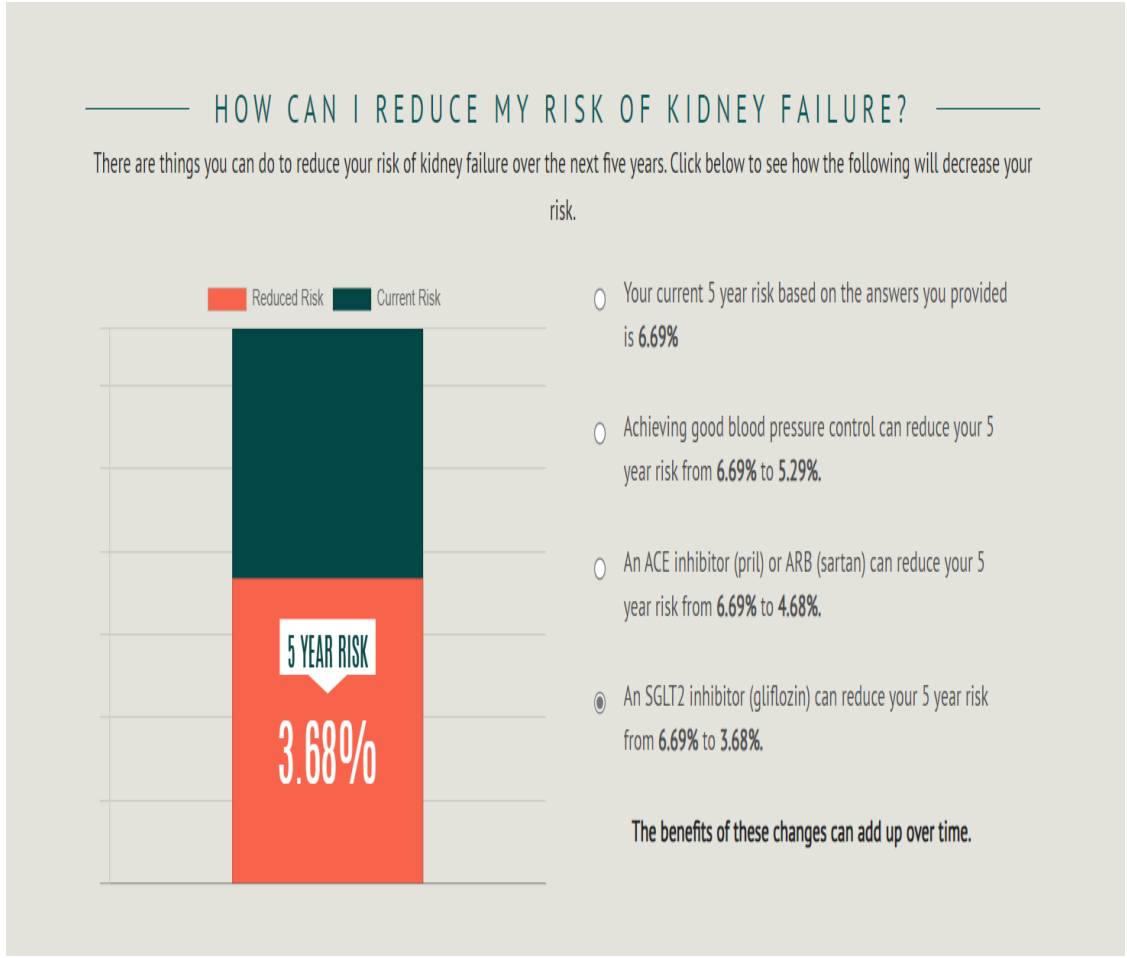
NICE Referral Criteria:

Taking into account the individual's wishes and other health conditions, considering referral to a hospital kidney doctor if:

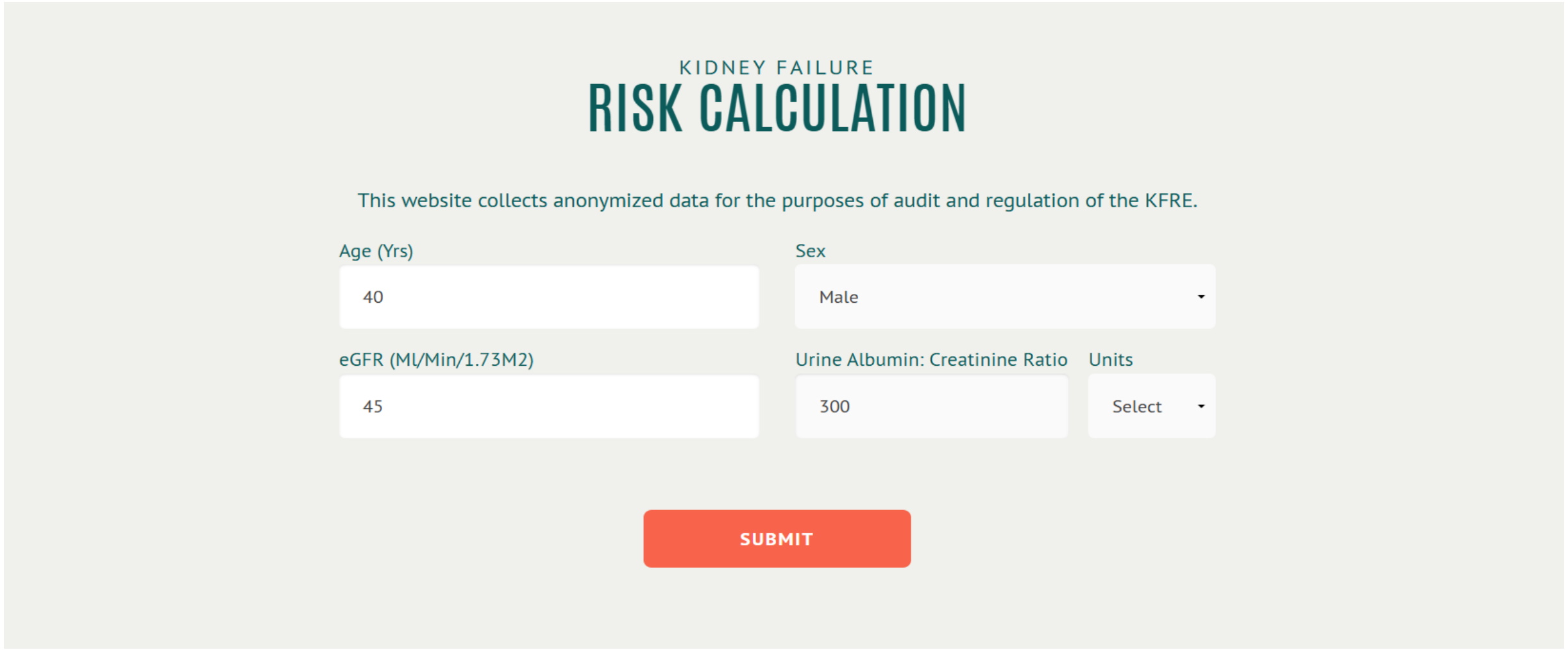
- 5-year KFRE predicted risk over 5% risk KFRE

KRFE – Example 2





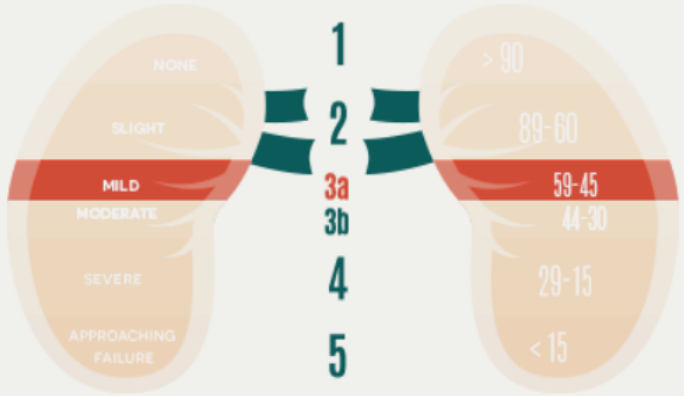
KFRE – Example 3



KFRE – Example 3

STAGE 3a

MILD DECREASE IN FUNCTION



Patient risk of progression to kidney failure requiring dialysis or transplant:

AT 2 YEARS	AT 5 YEARS
3.4 %	11.5 %

NICE Referral Criteria:

Taking into account the individual's wishes and other health conditions, considering referral to a hospital kidney doctor if:

- 5-year KFRE predicted risk over 5% risk KFRE

Other NICE referral criteria include:

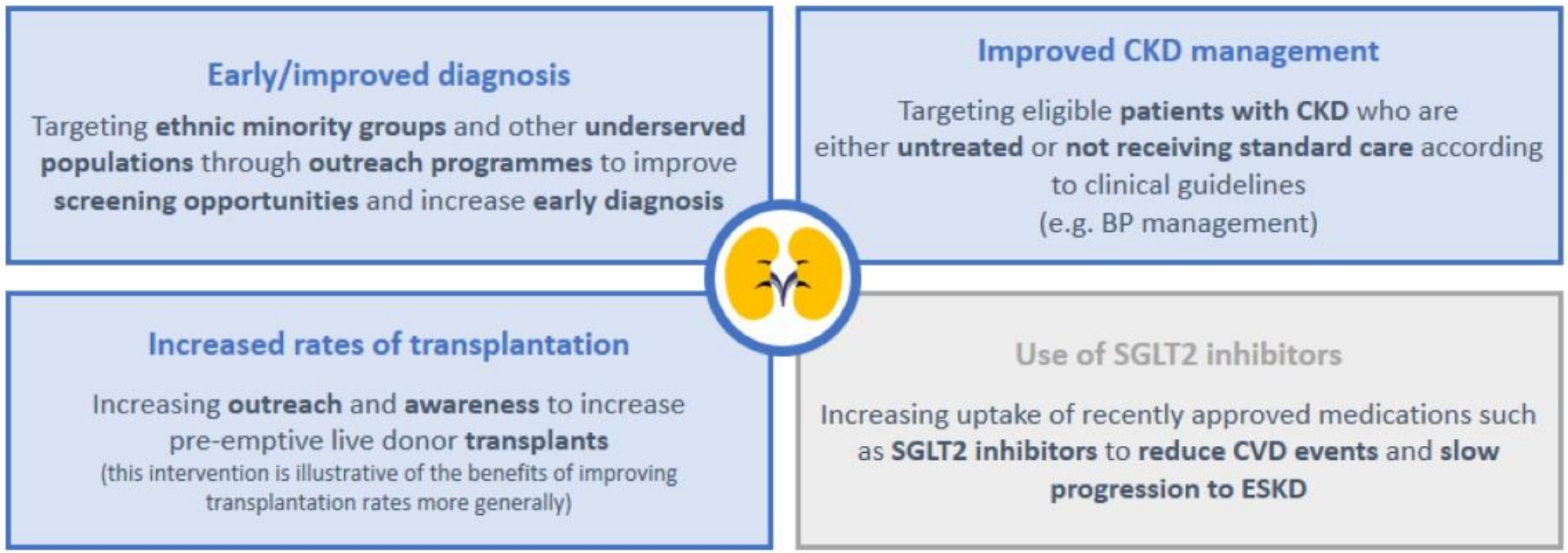
- an ACR of 70 mg/mmol or more, unless known to be caused by diabetes and already appropriately treated
- ACR of more than 30 mg/mmol (ACR category A3), together with haematuria
- a sustained decrease in eGFR of 25% or more and a change in eGFR category within 12 months
- a sustained decrease in eGFR of 15 ml/min/1.73 m2 or more per year

Are there patients that we are missing?

- Screening
- Case finding in order to code
- How do we tell patients?

How can nurses help prevent the disease progressing and best support our patients?

2023 Kidney Research UK report Recommended interventions to manage the burden of CKD



Modelling by Kidney Research UK suggests that improved implementation of these interventions could save more than 10,000 UK lives between 2023 and 2033 and would be cost effective

BP: blood pressure; CKD: chronic kidney disease; CVD: cardiovascular disease; ESKD: end-stage kidney disease; SGLT2: sodium-glucose co-transporter-2.

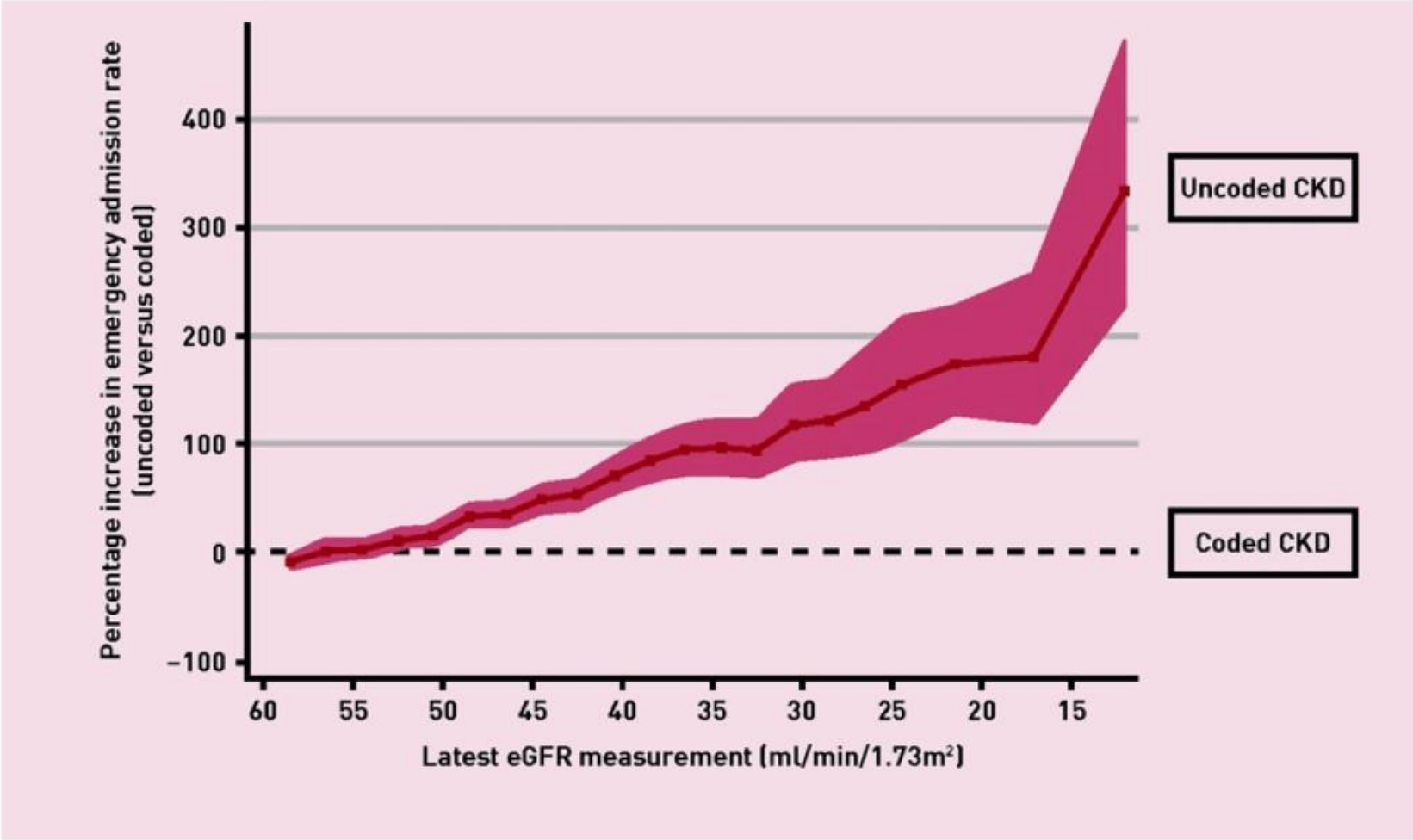
Kidney Research UK. *Kidney disease: a UK public health emergency. The health economics of kidney disease to 2033*. 2023.
Available at: https://www.kidneyresearchuk.org/wp-content/uploads/2023/06/Economics-of-Kidney-Disease-full-report_accessible.pdf (accessed November 2023).

Coding in patient record

- The 2023 CVDPrevent audit found 300,000 people with CKD did not have a coded diagnosis of their condition, despite recorded readings which indicate that they have these conditions

- 86.7% of adults with CKD had an e-GFR test in the preceding 12 months (a blood test), only 39% had a record of a urine ACR test (albumin:creatinine ratio) or protein:creatinine ratio) during that time.

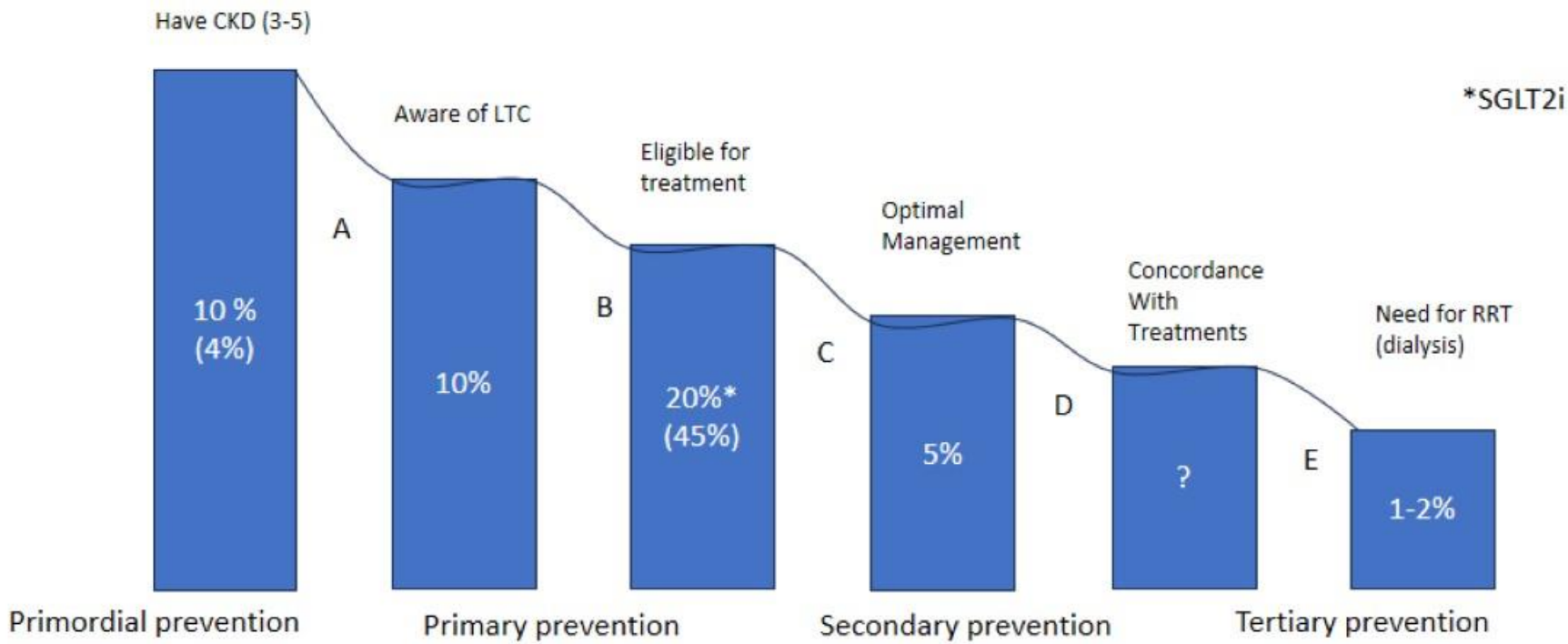
Comparison of emergency admissions between uncoded and coded patients with biochemical CKD stages 3–5 (using rate ratios).



Sally A Hull et al. Br J Gen Pract 2018;68:356-357

BJGP British Journal of General Practice
bringing research to clinical practice

Decay Model - CKD



Education

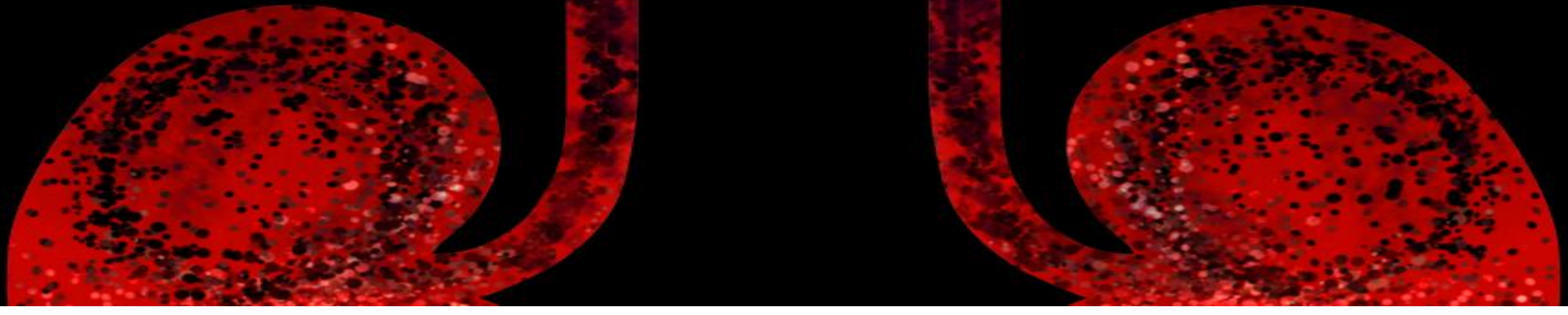
- Make sure the patient knows
- Most people don’t reach stage 5 (dialysis/transplant)
- Considering they won’t have any symptoms
- Helps if you explain why you are screening
- If someone has CKD there are medications to slow down the disease progression

Lifestyle interventions

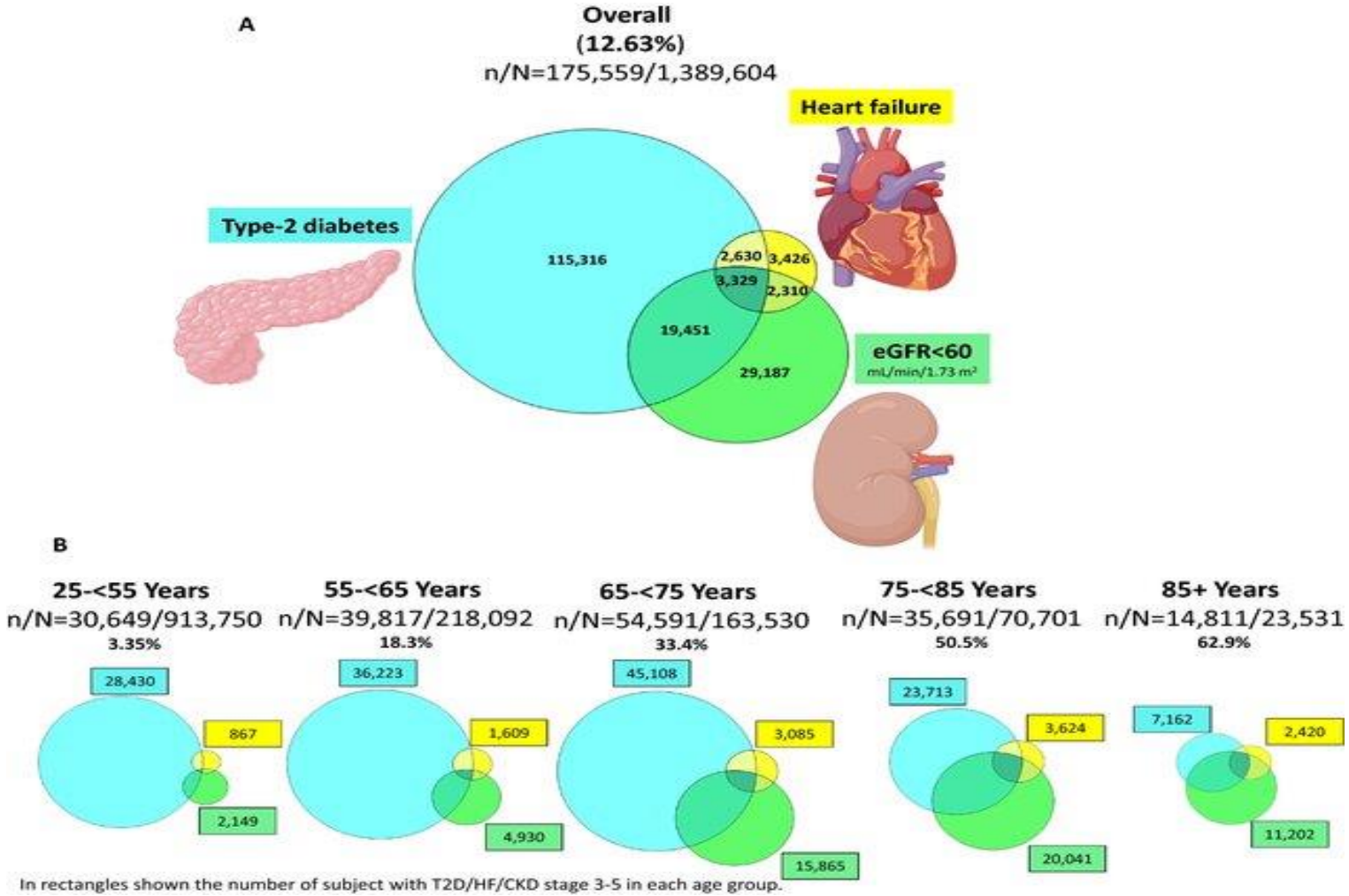
- Healthy diet and hydration
- Control blood pressure and blood sugar
- Physical activity
- Stop use of tobacco products
- Weight management
- Avoiding NSAID’s or other medications which can cause kidney damage

Kidney Care uk

Did you know you can lose 90% of your kidney function without realising?



Should we be treating multiple long term conditions in combination?



Epidemiology of the diabetes-cardio-renal spectrum: a cross-sectional report of 1.4 million adults. Schechter et al 2022, Cardiovascular Diabetology 21, 104.

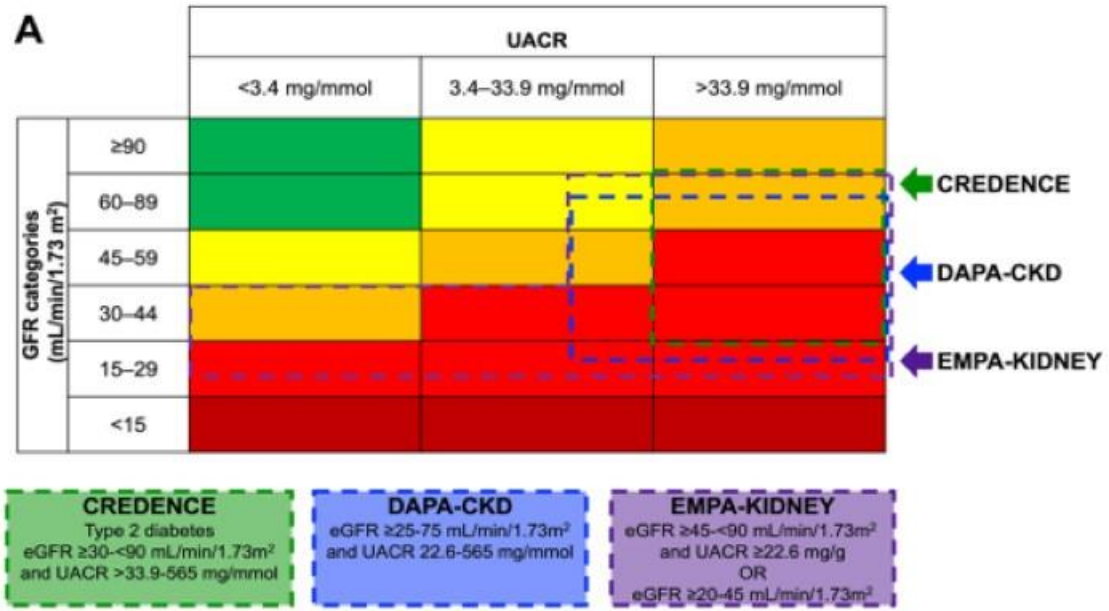
Blood pressure targets

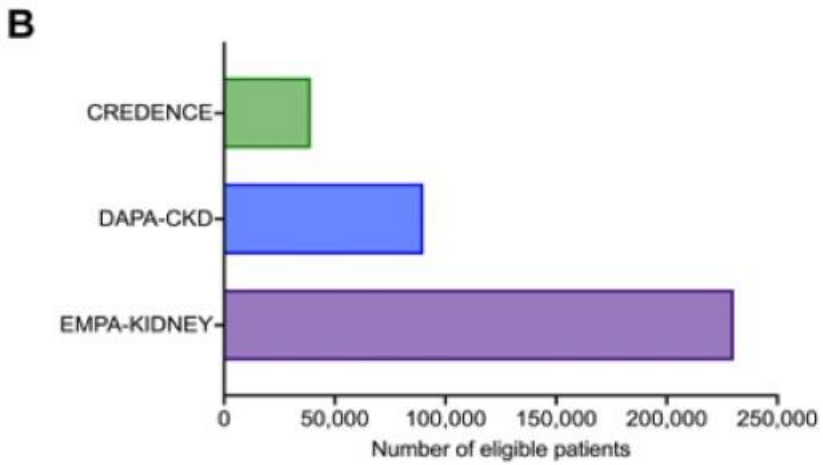
- Single most important measure
- NICE guidance
- Adults with CKD and ACR under 70 mg/mmol systolic below 140 and diastolic below 90
- Adults with CKD and ACR or 70 mg/mmol or more systolic below 130 and diastolic below 80
- Treat the patient in front of you

Medication optimisation to consider

- ACE inhibitor or ARB and titrate to maximum tolerated
- Statin
- SGLT2i
- Advice and guidance is available

Treat the patient in front of you





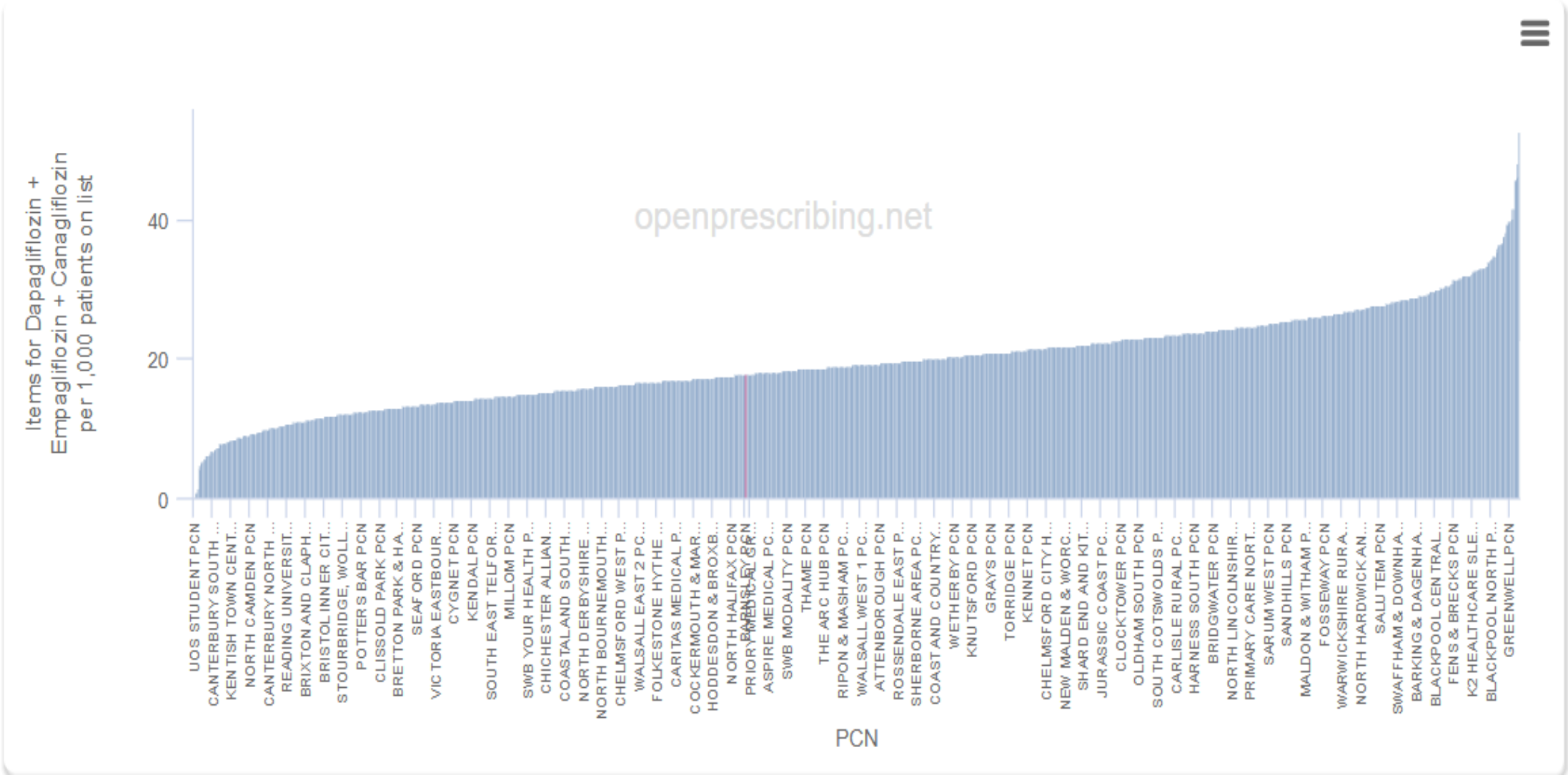
Australia population study
44.2% of adults with CKD be eligible for SGLT2i

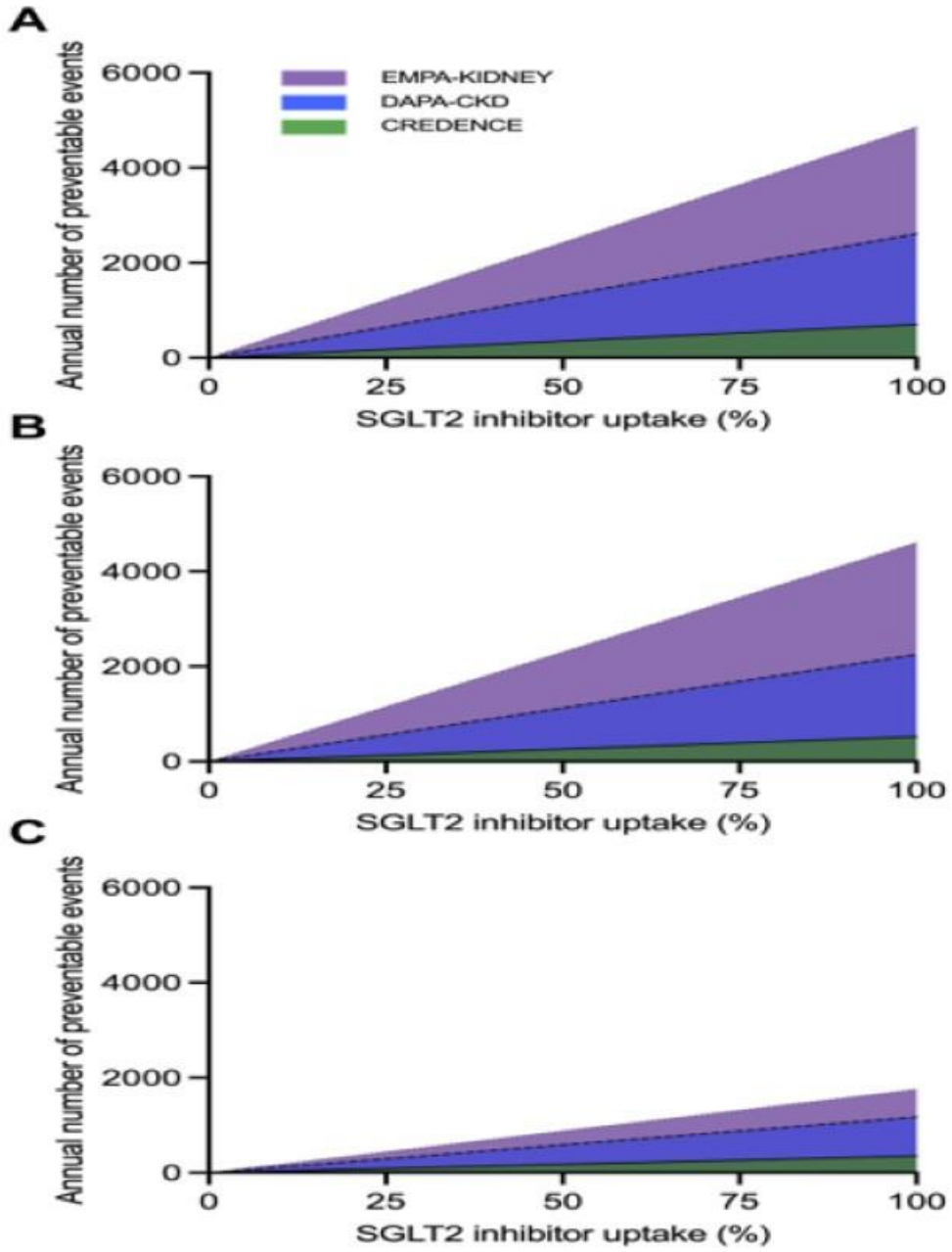
But currently 4.2%

The Lancet Regional Health – Western Pacific 2024 43DOI: (10.1016/j.lanwpc.2023.100988)

Items for Dapagliflozin + Empagliflozin + Canagliflozin vs patients on list by BARNSLEY PCN and other PCNs

in Mar '25





Optimal implementation (75%)

(A) cardiorenal, reduce 3644 (3526-3764)

(B) kidney-specific composite

(C) Kidney failure events expected to be prevented -1312 (1242-1385)

The Lancet Regional Health – Western Pacific 2024 43DOI: (10.1016/j.lanwpc.2023.100988)

Kidney Care UK

- Charity offering
    - Online and paper information leaflets
    - Counselling
    - Advocacy
    - Dietary advice

www.kidneycareuk.org

National Kidney Federation

- Charity offering
    - Online and paper information leaflets
    - Peer support
    - Financial support

www.kidney.org.uk

Summary

- CKD rates are increasing
- CKD causes premature death
- Screen appropriate groups with GFR and ACR
- Inform patient and code
- Lifestyle advice
- Optimise treatment – use advice and guidance if necessary
- We can slow down the disease progression and save lives