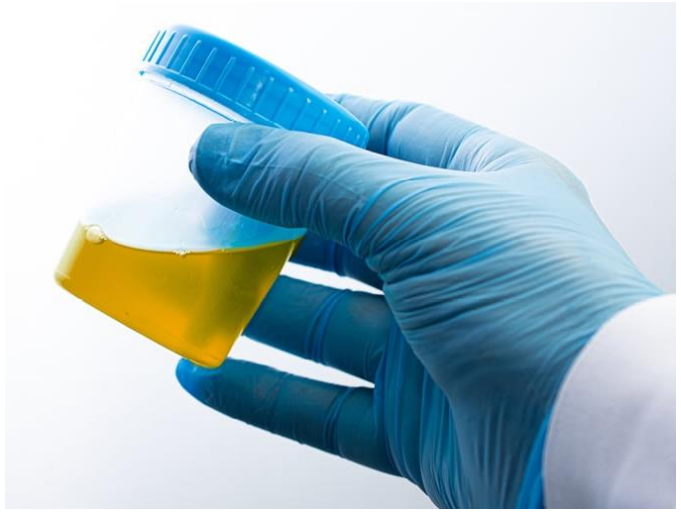
Starting Dialysis means that medical care has failed:

- 73-year-old, male with type II diabetes
- End stage kidney disease (diabetic nephropathy)
- Haemodialysis 3x weekly
- Retinopathy (registered blind)
- Previous non-STEMI
- Ejection fraction 40%
- Left mid foot amputation
- Wheelchair

Making a diagnosis of CKD

Blood test

- Creatinine based GFR estimation (eGFR)
- Calculation needs creatinine, age, gender
- Result expressed as ml/min/1.73m^2
- No ethnicity correction



Urine test

- Any urine
- Request albumin:creatinine ratio (UACR)
- Expressed as mg albumin/mmol creatinine
- (Dipstix less accurate)

CKD classification by eGFR and albuminuria

eGFR ml/min/1.73m²	Albuminuria categories (Based on urinary albumin:creatinine ratio)		
	A 1 <3 mg/mmol	A 2 3-30 mg/mmol	A 3 >30 mg/mmol
G1 ≥ 90	No CKD	G1 A2	G1 A3
G2 60-89	No CKD	G2 A2	G2 A3
G3a 45-59	G3a A1	G3a A2	G3a A3
G3b 30-44	G3b A1	G3b A2	G3b A3
G4 15-29	G4 A1	G4 A2	G4 A3
G5 <15	G5 A1	G5 A2	G5 A3

Increasing risk

Increasing risk

KDIGO CKD workgroup. Kidney International 2024;105(4S):S117–S314

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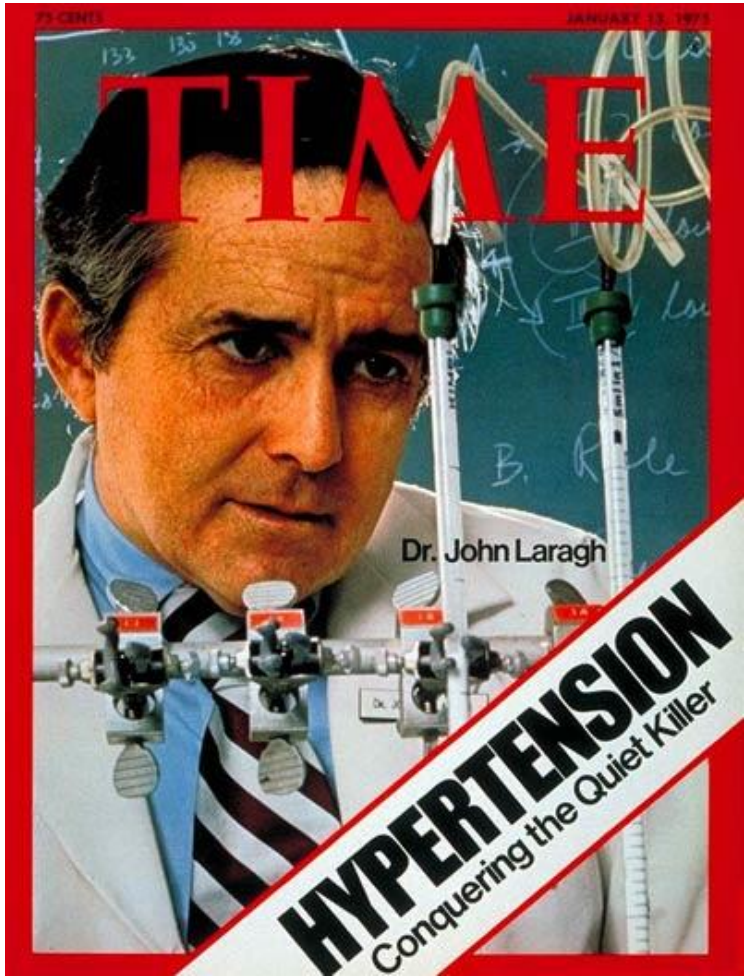
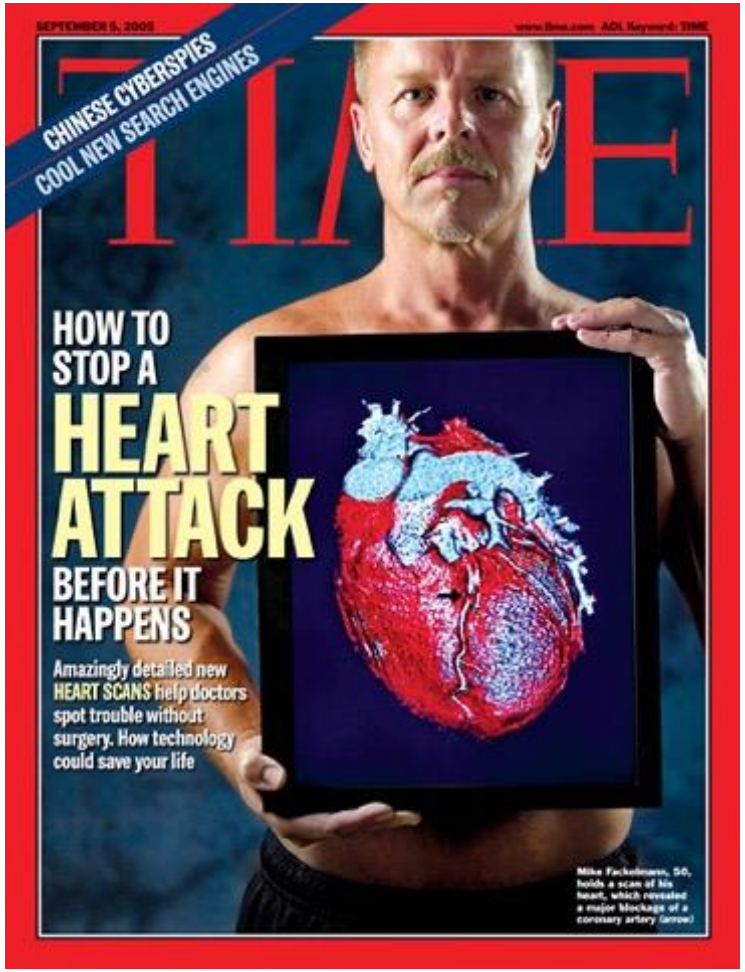
Should persons with hypertension, diabetes, and cardiovascular disease should be screened for CKD?





Shilpak MG et al, Kidney Int 2021 Jan;99(1):34-47

Seek and you will find

ANALYSIS

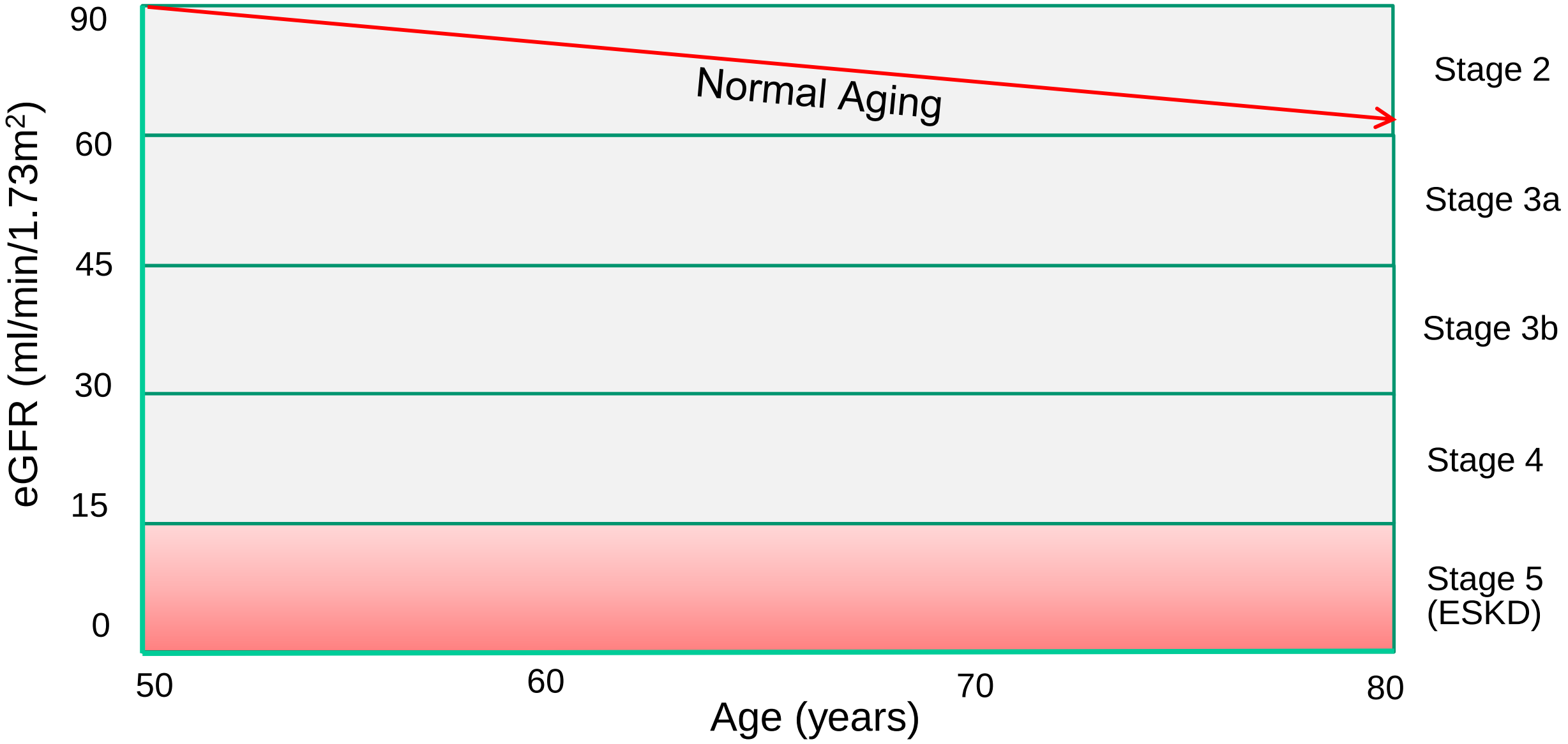
Re-evaluating national screening for chronic kidney disease in the UK

New drugs have increased the potential benefits of screening but many unanswered questions remain about the best way to identify people for treatment, say **Vageesh Jain and colleagues**

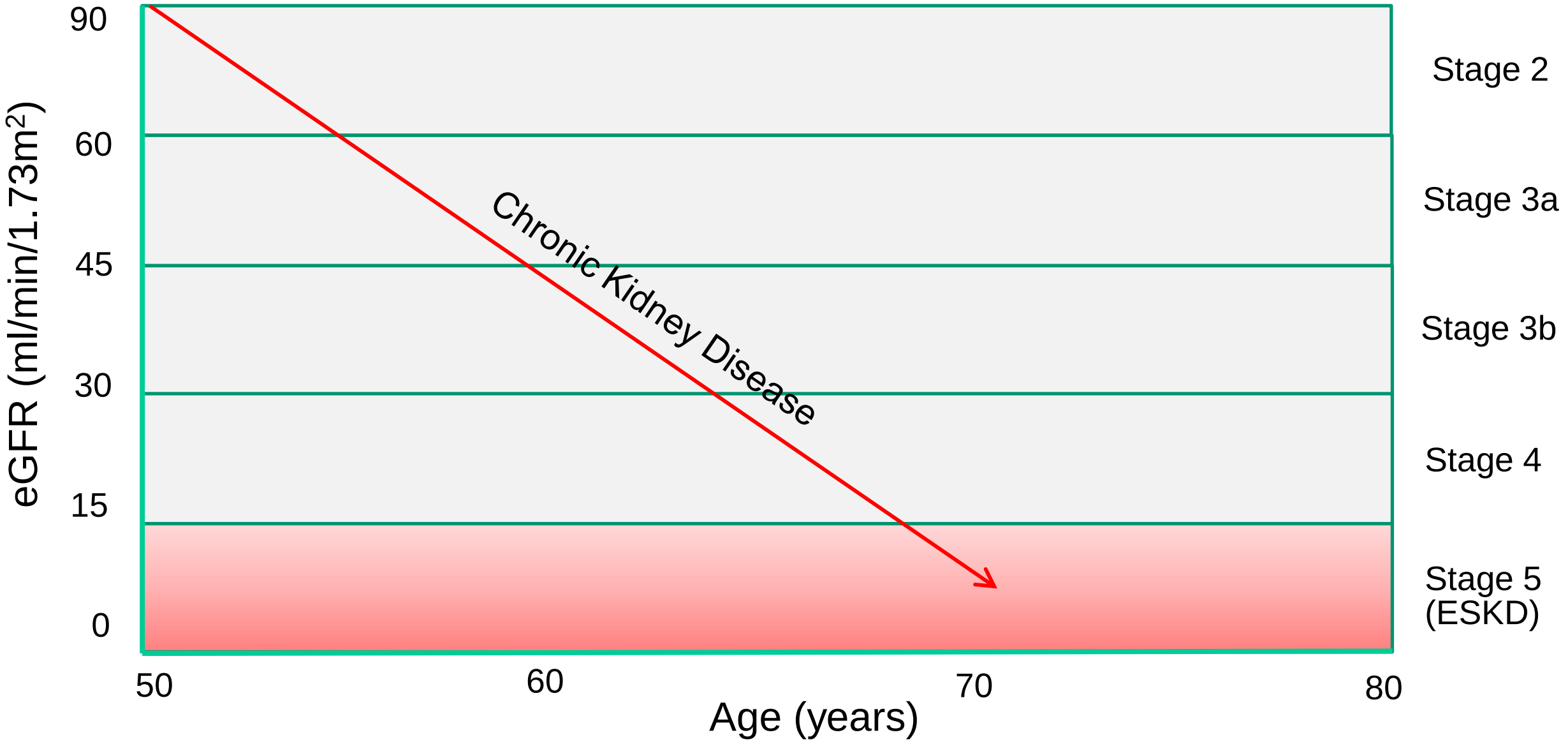
SATURN STILLS/SPL

BMJ June 2023

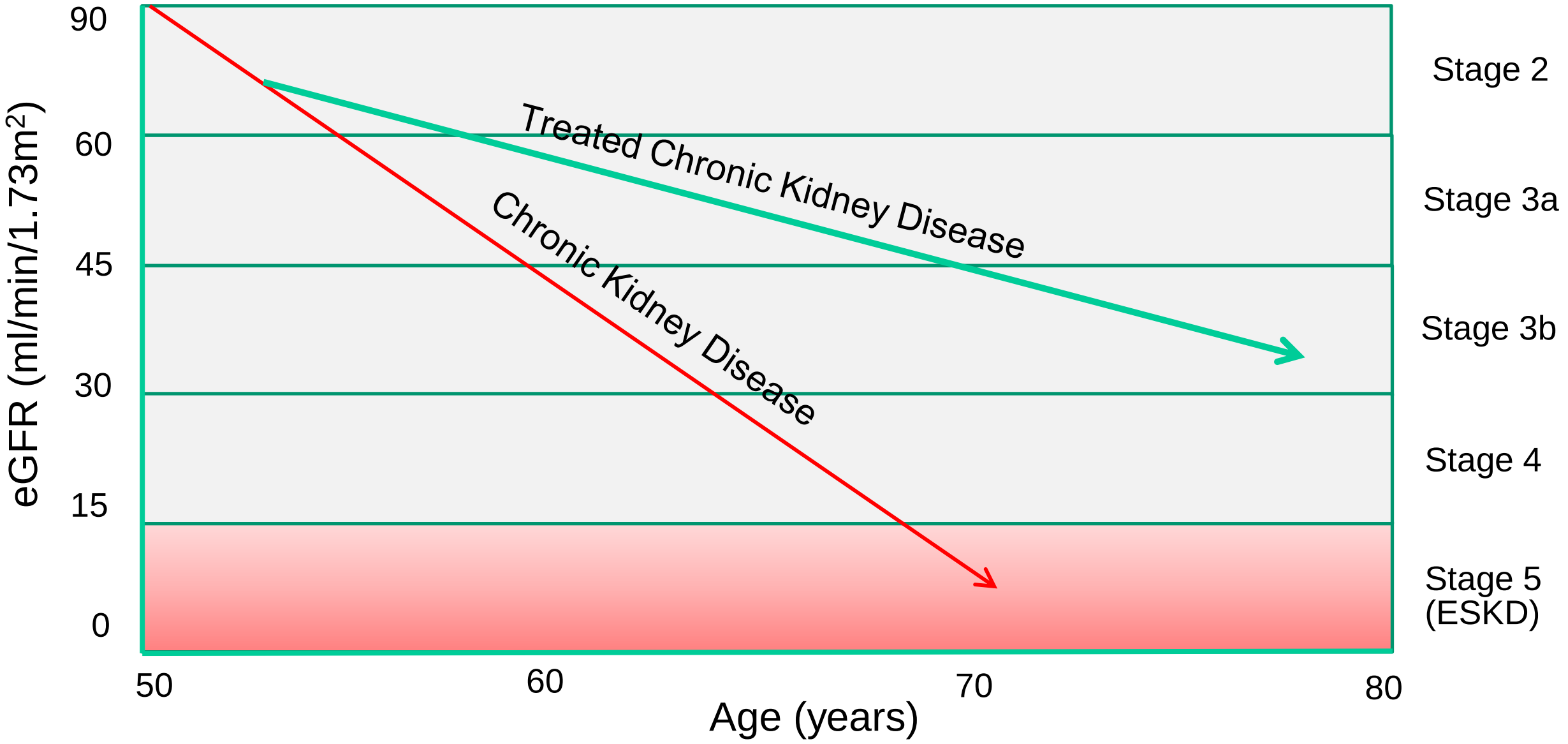
Progressive decline in kidney function



Progressive decline in kidney function



Kidney Protection



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Increasing risk

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KDIGO CKD workgroup. Kidney International 2024;105(4S):S117–S314

Care 1: White male with Type 2 diabetes and CKD

- 68-year-old white man with type II diabetes for 10 years
- Weight 135 kg, BMI 31.8 kg/m^2
- Early diabetic retinopathy
- Metformin 500 mg bd, Gliclazide 40 mg bd
- Ramipril 10 mg od, Atorvastatin 20 mg od
- Annual review
- BP 155/95 mmHg

eGFR 52 ml/min/1.73m^2 (previously 58)
UACR 672 mg/mmol (previously 309)
HbA1c 72 mmol/mol (8.7%)

CKD classification by eGFR and albuminuria

eGFR ml/min/1.73m²	Albuminuria categories (Based on urinary albumin:creatinine ratio)		
	A 1 <3 mg/mmol	A 2 3-30 mg/mmol	A 3 >30 mg/mmol
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G3b 30-44			
G4 15-29			
G5 <15			

Increasing risk

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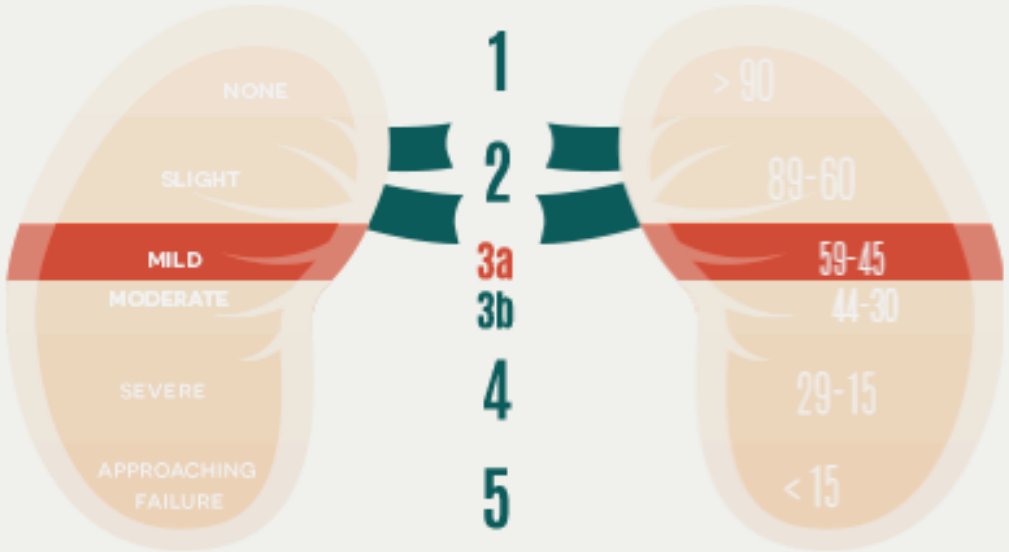
STAGE 3a

MILD DECREASE IN FUNCTION

CKD STAGES	ESTIMATED GLOMERULAR FILTRATION RATE
NONE	1
SLIGHT	2
MILD	3a
MODERATE	3b
SEVERE	4
APPROACHING FAILURE	5



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

AT 2 YEARS	AT 5 YEARS
1.2 %	4.3 %

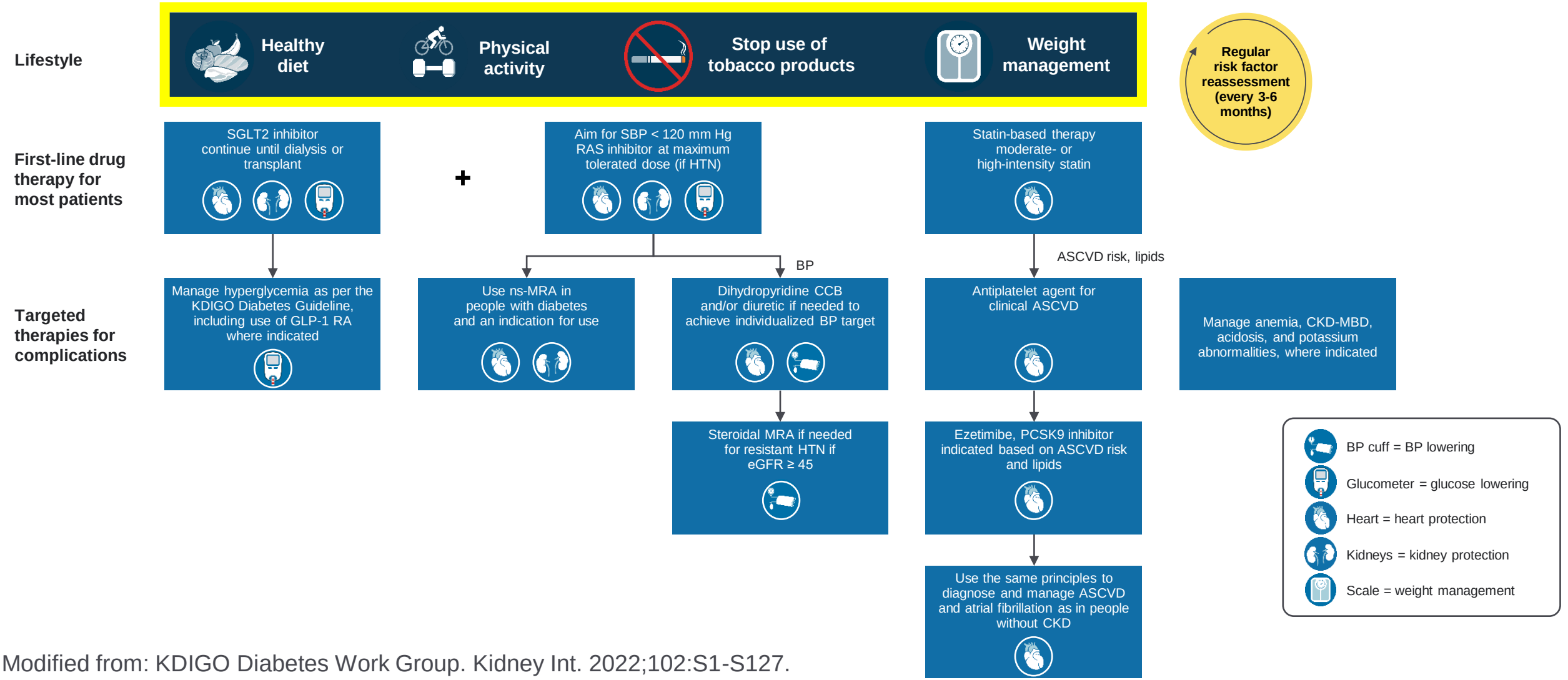
NICE Referral Criteria:

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

https://kidneyfailurerisk.co.uk

2024 KDIGO CKD Evaluation and Management Guideline



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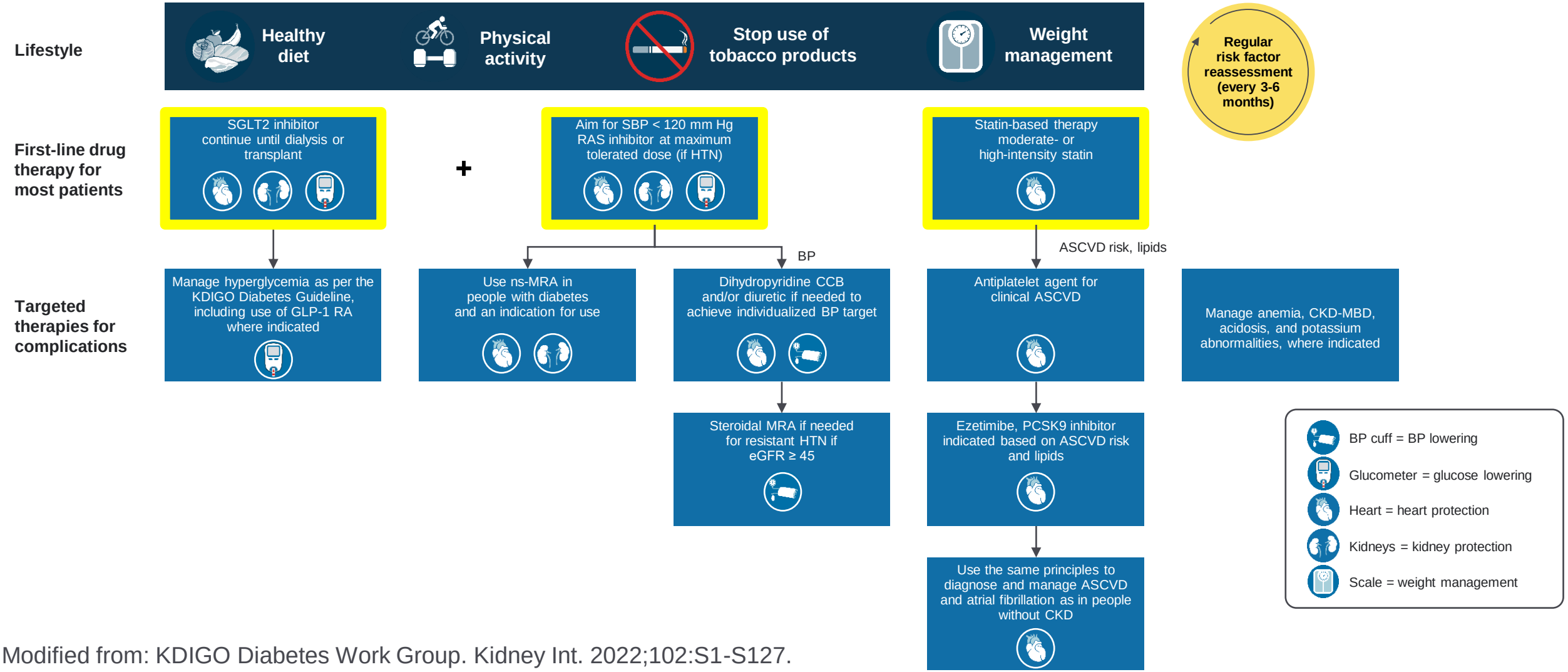

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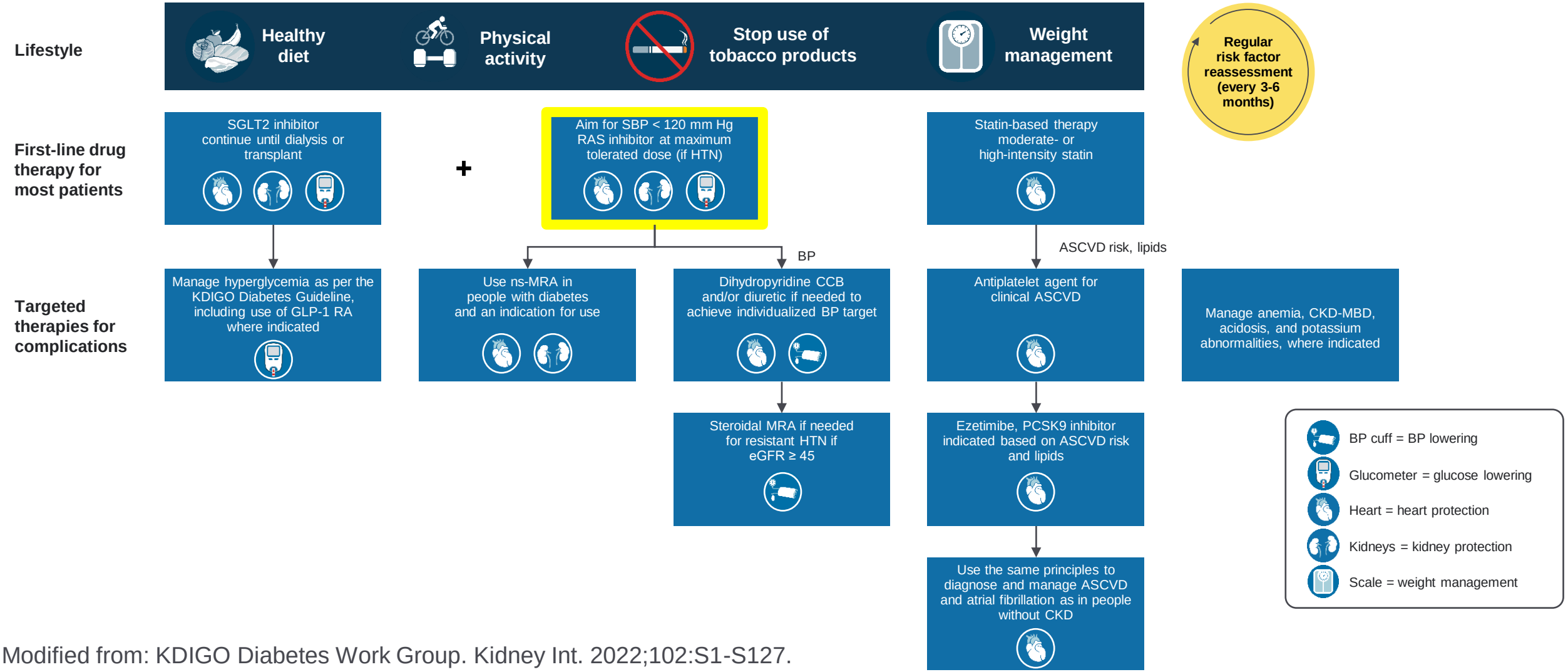

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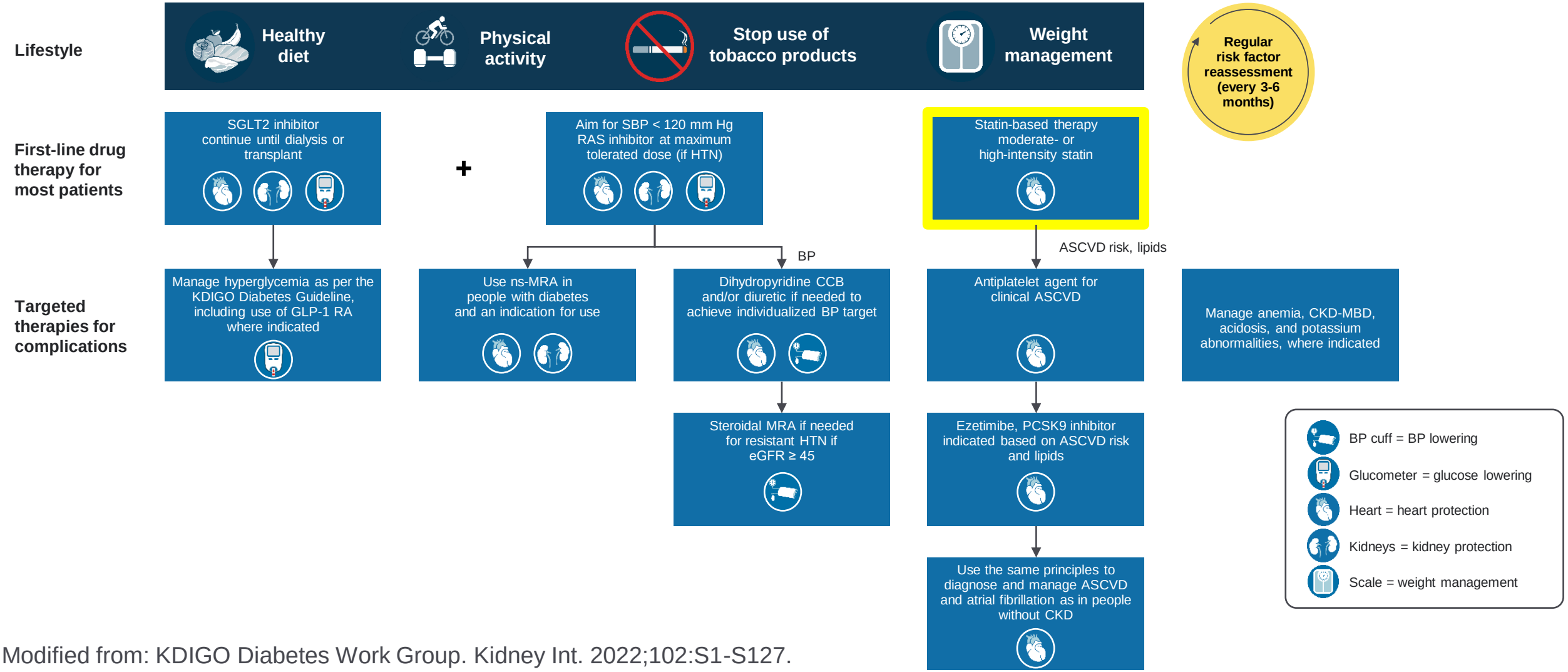

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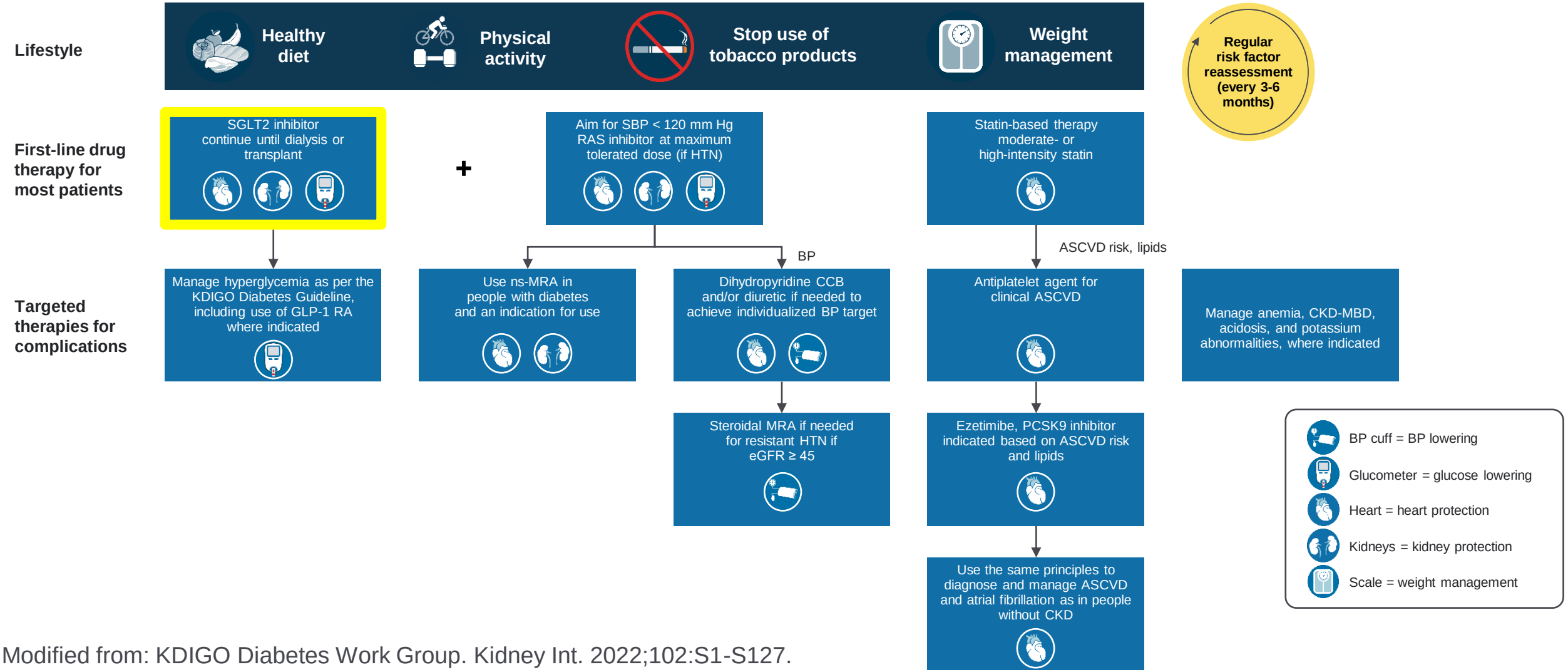

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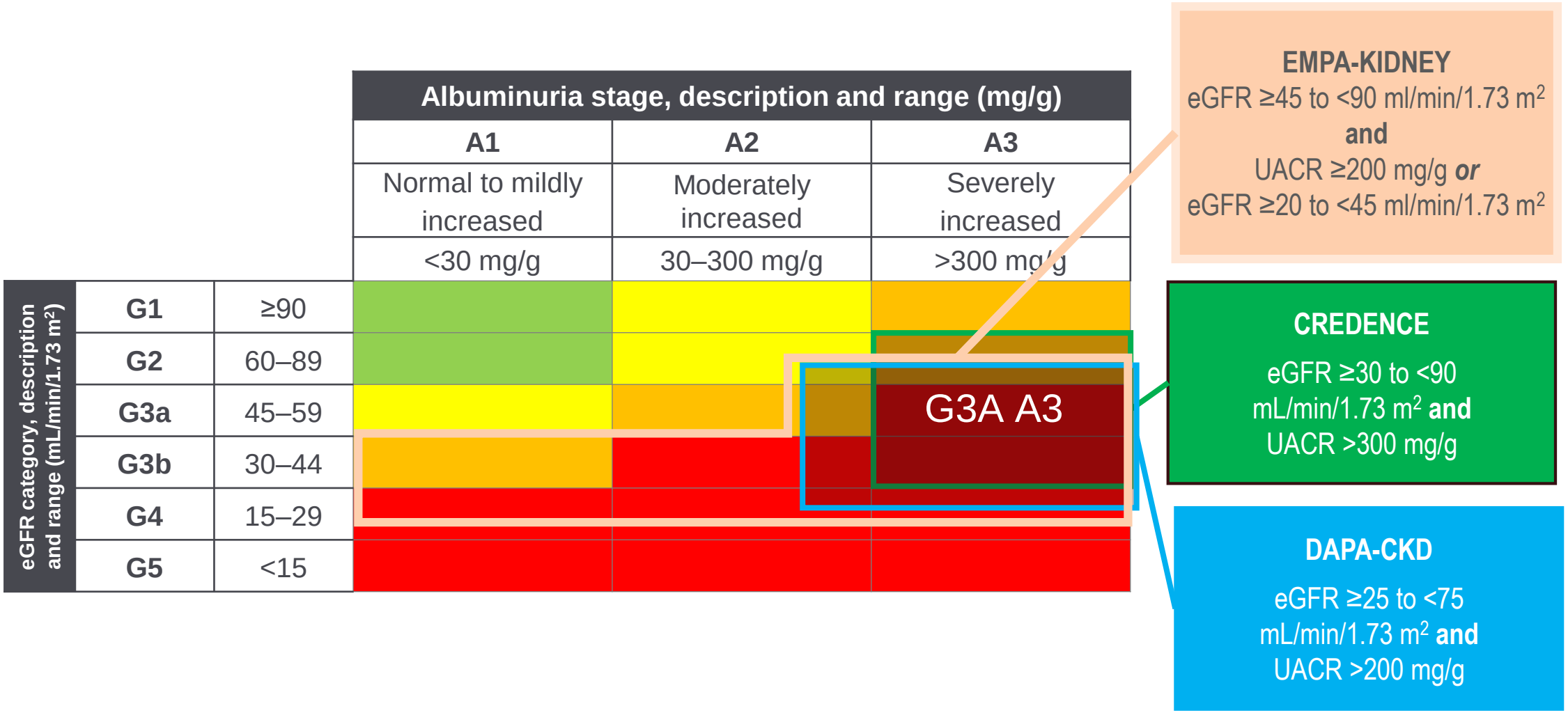
Comparison of CREDENCE, DAPA-CKD and EMPA Kidney Trials



CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; UACR, urine albumin-to-creatinine ratio

The EMPA-KIDNEY Collaborative Group. *Nephrol Dial Transplant* 2022;gfac040; Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. *Kidney Int Suppl* 2013;3:1; Perkovic V *et al. N Engl J Med* 2019; 380:2295; Wheeler DC *et al. Nephrol Dial Transplant* 2020;35:1700

Inclusion Criteria: SGLT2 inhibitor trials in Chronic Kidney Disease

	CREDENCE[1]	DAPA-CKD[2]	EMPA-KIDNEY[3]
Published	April 2019	September 2020	November 2022
SGLT2 inhibitor	Canagliflozin	Dapagliflozin	Empagliflozin
Non diabetic patients	No	Yes	Yes
eGFR range	30 to 90 ml/min/1.73m^2	25 to 75 ml/min/1.73m^2	20 to 90 ml/min/1.73m^2
UACR range	300-5000 mg/g 33.9-565 mg/mmol	200-5000 mg/g 22.6-565 mg/mmol	> 200 mg/g (22.6 mg/mmol) if eGFR >45 ml/min/1.73m^2

[1]Perkovic V et al, NEJM 2019;380:2295-2306
[2]Heerspink HJL et al, NEJM 2020;383:1436-1446
[3]Herrington W et al, NEJM Moa2204233

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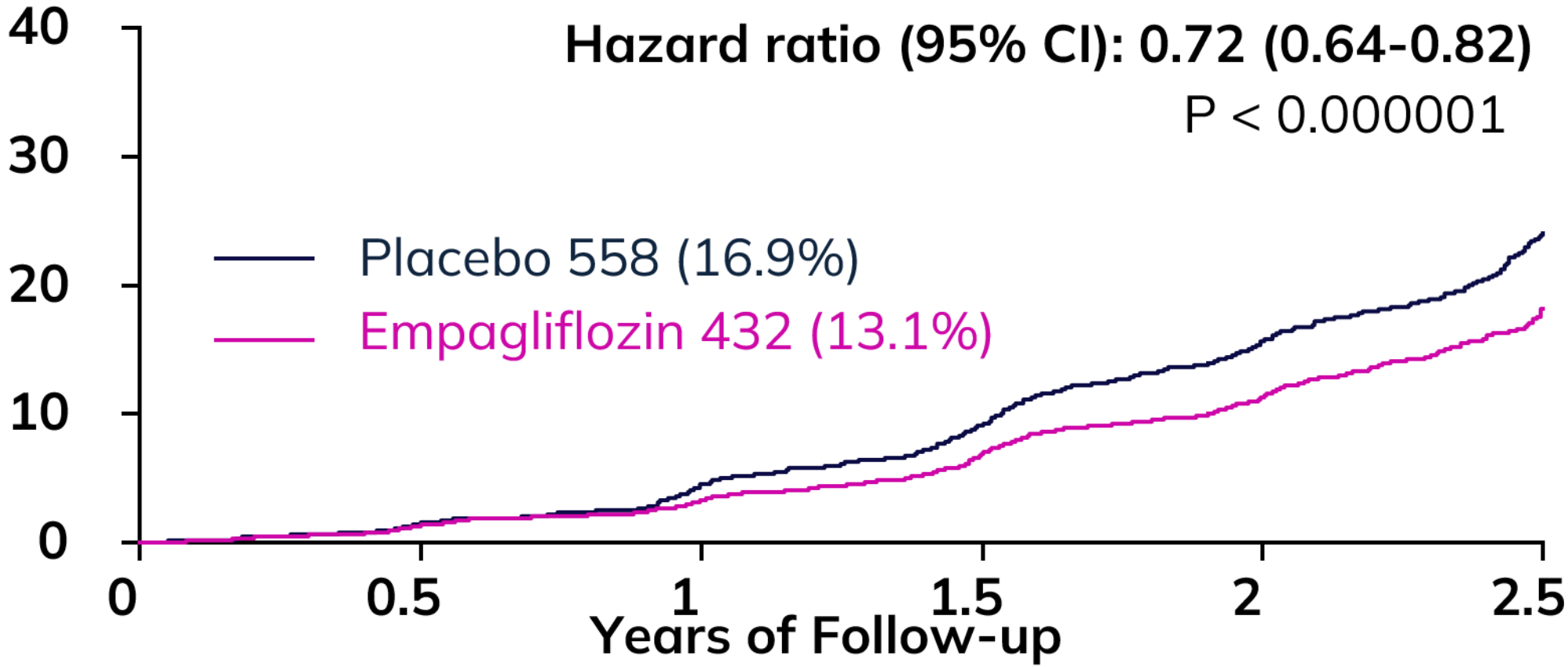
EMPA Kidney: Primary Composite Outcome

(CV death, or ESKD, >40% eGFR decline or to <10 ml/min/1.73m^2 or renal death)



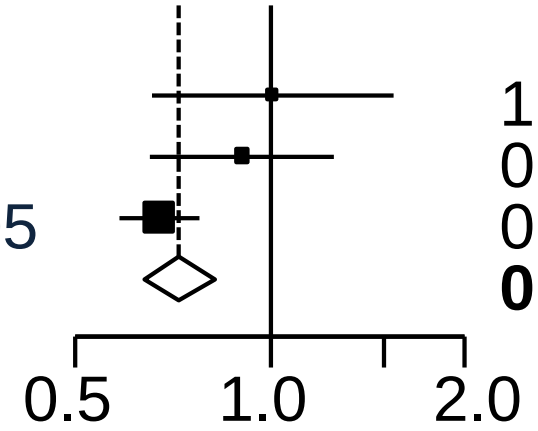
EMPA-KIDNEY

MRC Population Health Research Unit

UNIVERSITY OF OXFORD

EMPA Kidney: Primary outcome by albuminuria

uACR mg/g		No. of events / participants: Empagliflozin	Placebo	Hazard Ratio (95% CI)
<30	(A1)	42/665	42/663	1.01 (0.66–1.55)
≥30 ≤300	(A2)	67/927	78/937	0.91 (0.65–1.26)
>300	(A3)	323/1712	438/1705	0.67 (0.58–0.78)
All participants				**0.72 (0.64–0.82)**

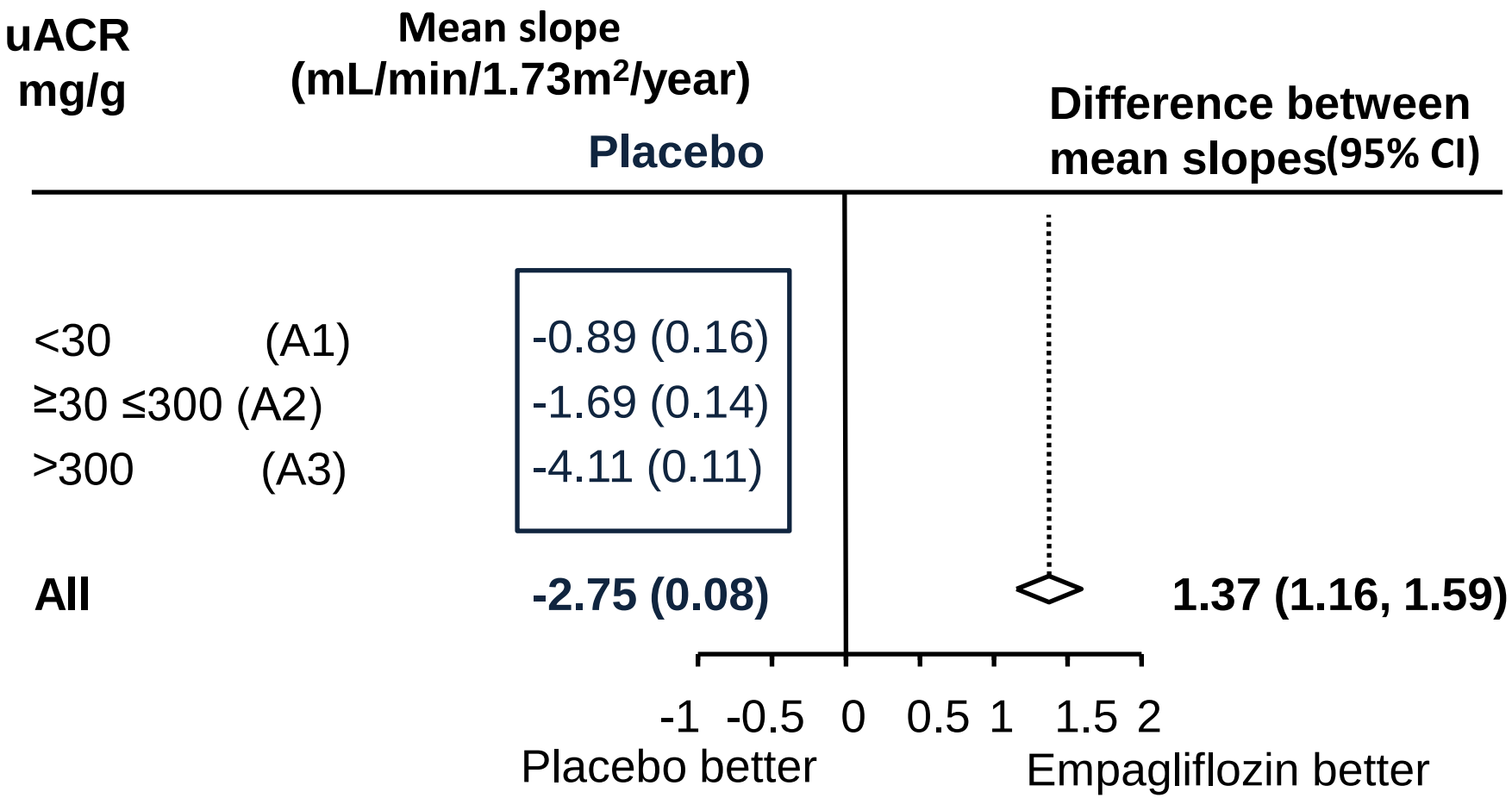


Trend P value= 0.02

Herrington W et al, NEJM 2023;388:117-127

EMPA Kidney: Chronic eGFR slopes by albuminuria

Prespecified exploratory analyses



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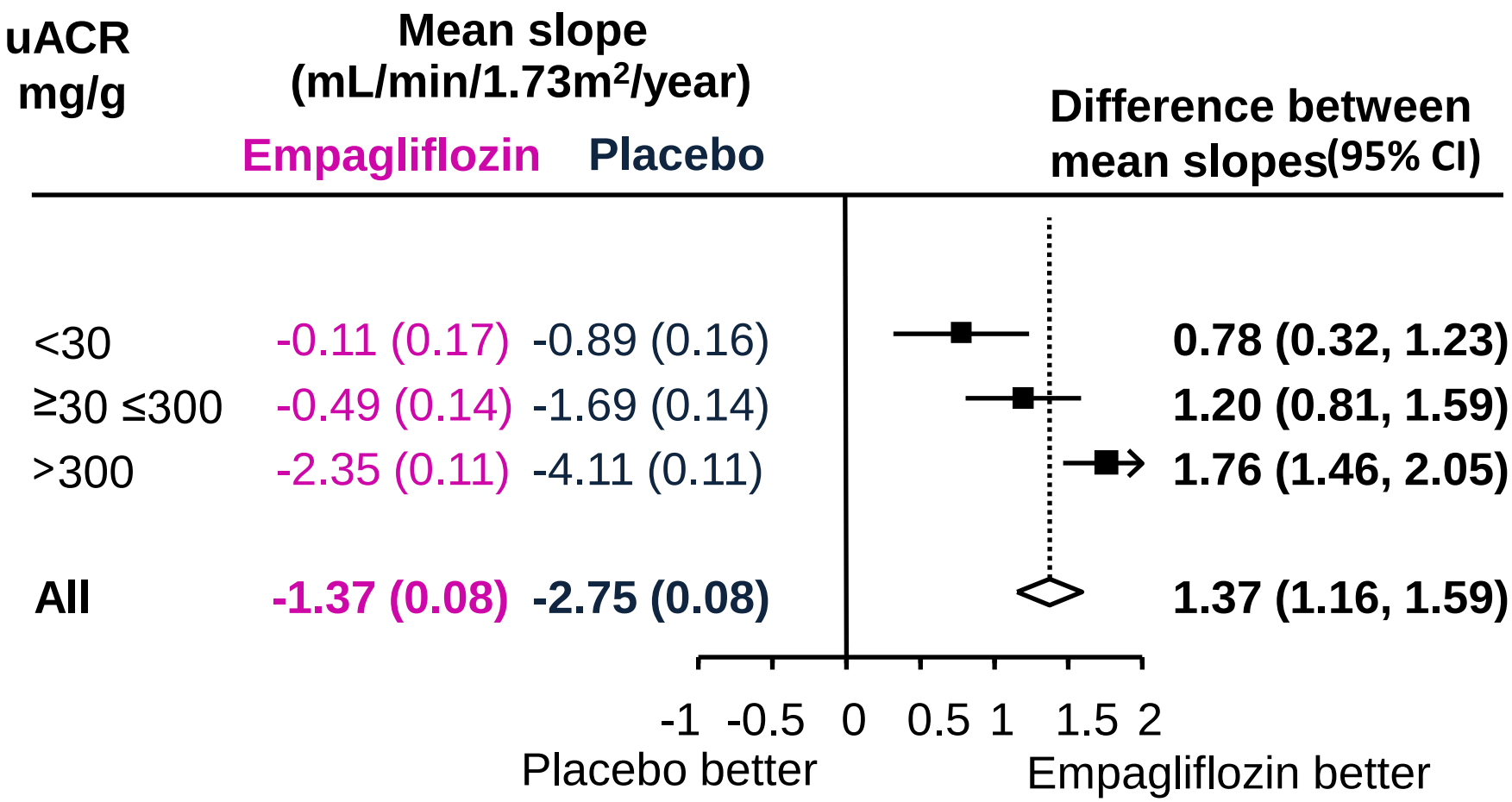


Herrington W et al, NEJM 2023;388:117-127

TAKE HOME MESSAGES: SGTL2 INHIBITORS IN CKD

In which patients should SGLT2 inhibitors be considered?

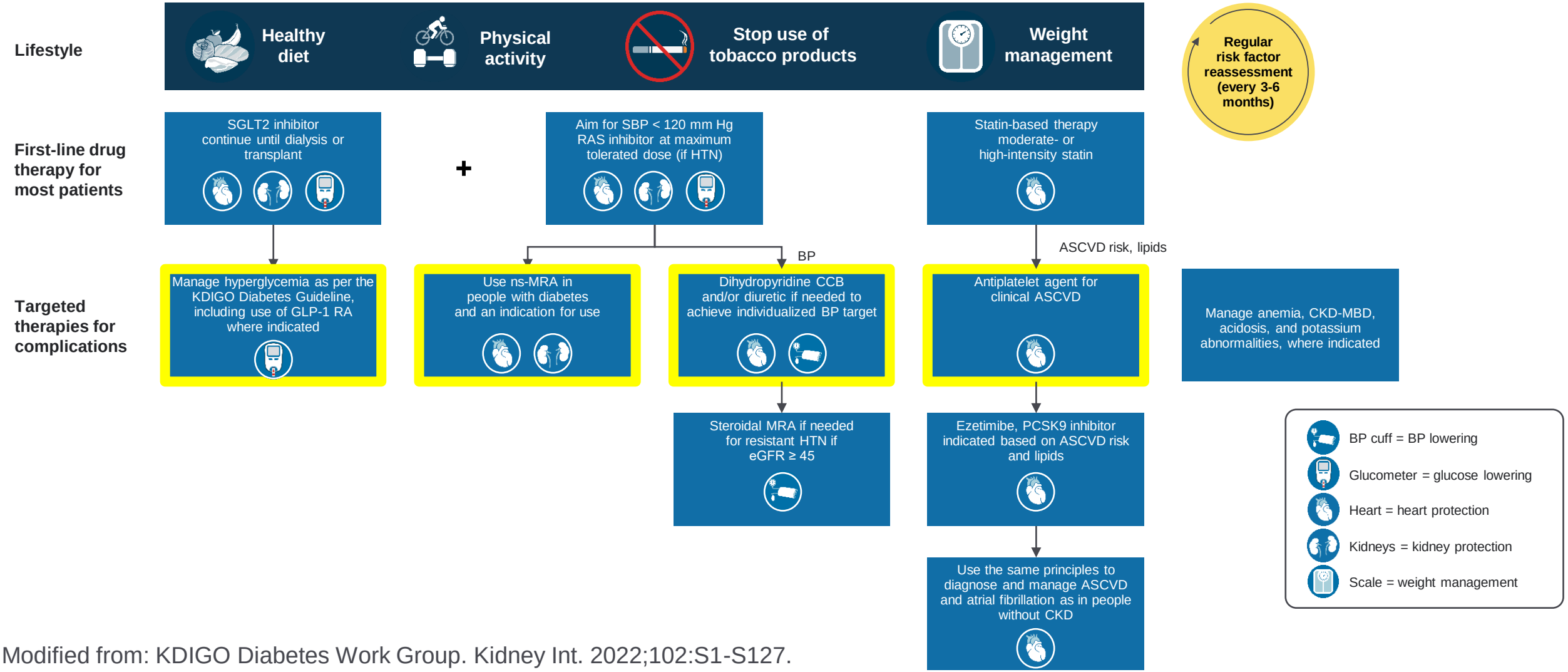
Recommendation 3.7.1: We recommend treating patients with type 2 diabetes (T2D), CKD, and an eGFR >20 ml/min per 1.73 m^2 with an SGLT2i (1A).

Recommendation 3.7.2: We recommend treating adults with CKD with an SGLT2i for the following (1A): eGFR >20 ml/min per 1.73 m^2 with urine ACR >200 mg/g (>20 mg/mmol), or heart failure, irrespective of level of albuminuria.

Recommendation 3.7.3: We suggest treating adults with eGFR 20 to 45 ml/min per 1.73 m^2 with urine ACR <200 mg/g (<20 mg/mmol) with an SGLT2i (2B).

Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. *Kidney Int* 2024;105(4S):S117–S314

2024 KDIGO CKD Evaluation and Management Guideline



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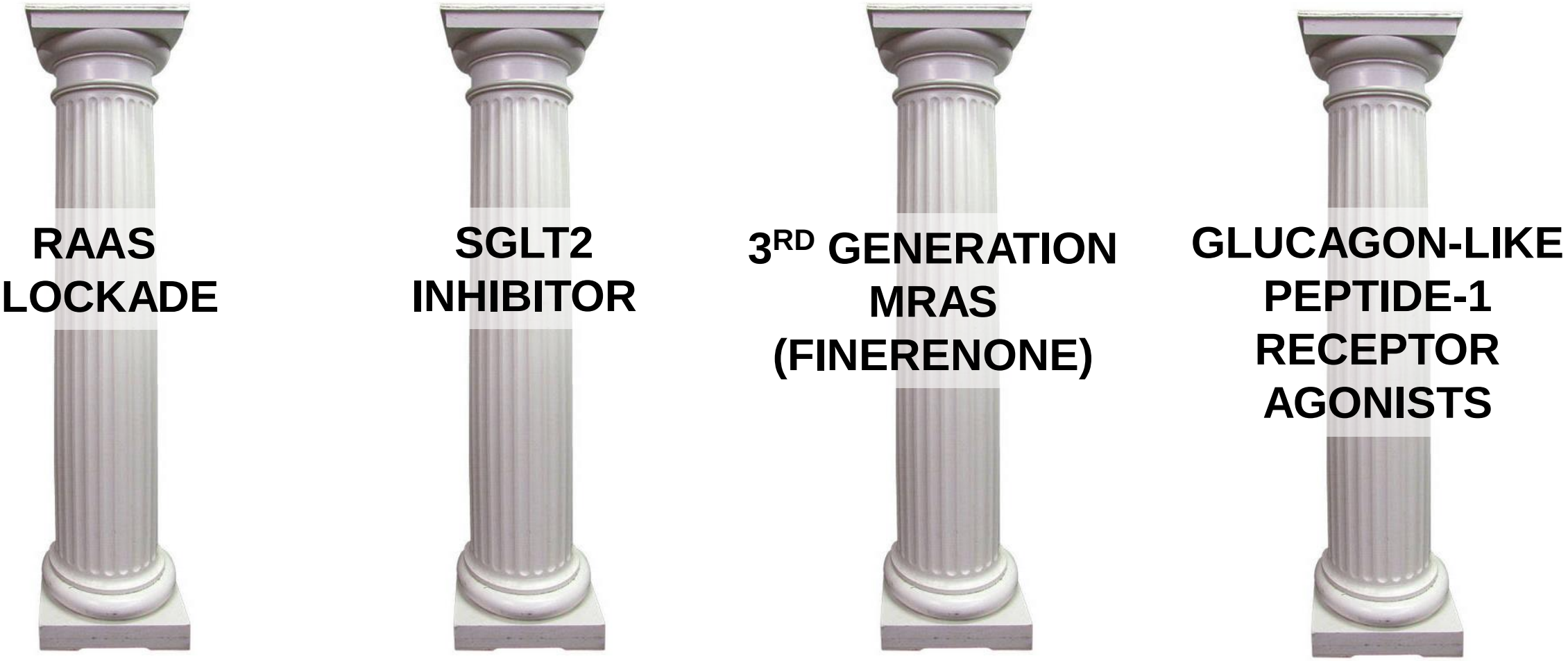
- Ramipril 10 mg od, Atorvastatin 20 mg od, Furosemide 40 mg od
- Dapagliflozin 10 mg od,
- Finerenone 25 mg od
- Semaglutide 2.4 mg weekly

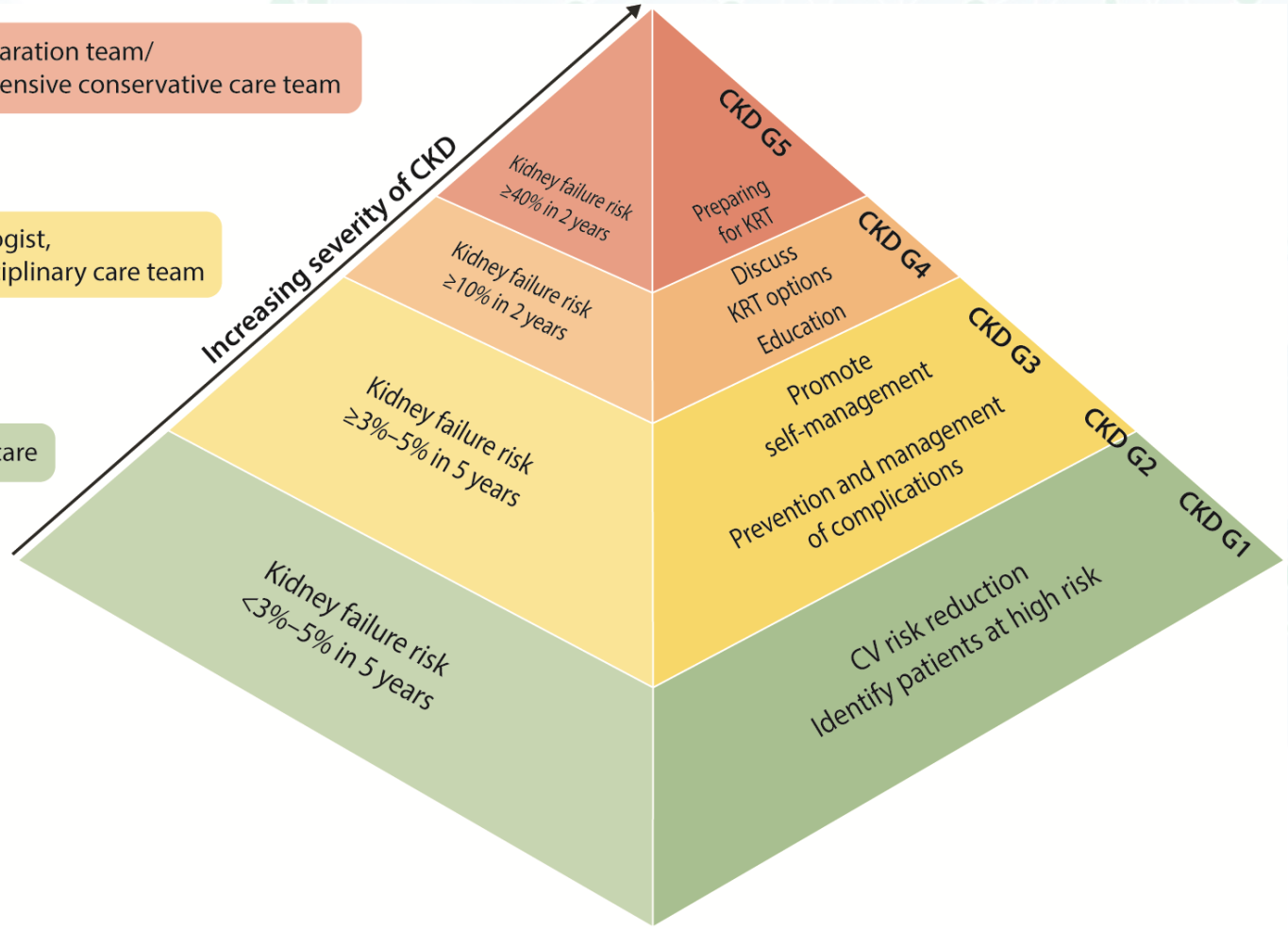
Four Pillars of CardioRenal protection in Diabetic Kidney Disease



Concept borrowed from: Four pillars of heart failure: Contemporary pharmacological therapy for heart failure with reduced ejection fraction. Straw S. http://orcid.org/0000-0002-2942-4574

MANAGEMENT – ADVANCED CARE PLANNING

Plans addressing future health care states should be jointly agreed with people with CKD and their families/carers and known to all. Advanced care planning for those choosing supportive care is particularly important.



Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. *Kidney Int* 2024;105(4S):S117–S314

The talk in one slide

- Many recent develops in preventative nephrology which should improve patient outcomes and help avoid CV events dialysis in CKD.
- Lifestyle modifications, lowering blood pressure and controlling diabetes underpin management of CKD (?Primary Care).
- Statin-based regimens reduce the risk of atherosclerotic cardiovascular events in CKD patients (less benefit in ESKD).
- ACEi/ARB slow progression in patients with albuminuria
- SGLT2 inhibitors are renoprotective in CKD patients and reduce the risks of cardiovascular complications, particularly heart failure.
- Additional renoprotective therapies in patients with type 2 diabetes include 3rd Generation MRAs and GLP-1 RAs.


THE END