

Role of eGFR and UACR in the screening, diagnosis, and treatment response in patients with CKD and T2DM

Healthy diet



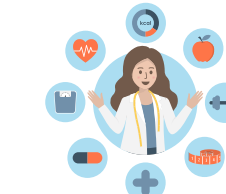
Physical activity



Smoking cessation



Weight management



DEFINITION

eGFR:

The Estimated Glomerular Filtration Rate (eGFR) is a measure of kidney function. It estimates the rate of blood filtered by glomeruli.

UACR:

The urine albumin-creatinine ratio (UACR) is a test to detect and monitor kidney disease by measuring the amount of albumin in the urine compared to creatinine.

CALCULATION AND SIGNIFICANCE

eGFR:

- Indicative of kidney function and uses serum creatinine levels, age, sex, and sometimes race.
- Normal range 90-120mL/min/1.73m²
- eGFR calculators are available online at nkdep.nih.gov.
- Generally, the higher the number, the better your kidney function.
- Lower eGFR is also associated with CV events and mortality.

CALCULATION AND SIGNIFICANCE

UACR

- Detects albuminuria which is an early sign of kidney damage.
- Calculates urine albumin to creatinine ratio in a single urine sample (random spot urine collection). Urine creatinine corrects for urine concentration or dilution.
- Normal range: less than 30mg/g.
- Two of three specimens of UACR collected within a 3- to 6-month period should be abnormal before considering an individual to have moderately or severely elevated albuminuria.
- A higher UACR indicates more albumin in the urine, which is indicative of kidney damage.
- UACR is a potent predictor of CV mortality and independent of eGFR.

SCREENING AND DIAGNOSIS OF CKD FOR PEOPLE WITH DIABETES

Regular screening allows for earlier CKD diagnosis in patients with diabetes and initiation of kidney and cardioprotective therapies which can profoundly mitigate morbidity and mortality risk.

Who and when to screen

T1D

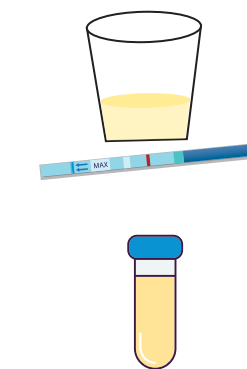
T1D: Yearly starting 5 years after diagnosis

T2D

T2D: Yearly starting at diagnosis

How to screen

Spot UACR
and
eGFR



What to do with a positive result?

Repeat and confirm:

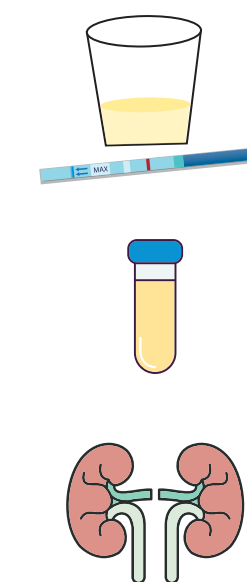
- Evaluation possible temporary or spurious causes
- Consider using cystatin C and creatinine to more precisely estimate GFR
- Only persistent abnormalities define CKD

Initiate evidence-based treatments



What defines CKD diagnosis?

Persistent UACR ≥ 30 mg/g
and/or
Persistent eGFR < 60 mL/min/1.73m²
and/or
Other evidence of kidney damage



ACR, albumin-to-creatinine ratio; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; T1D, type 1 diabetes; T2D, type 2 diabetes

Identifying patients at risk for DKD onset or progression

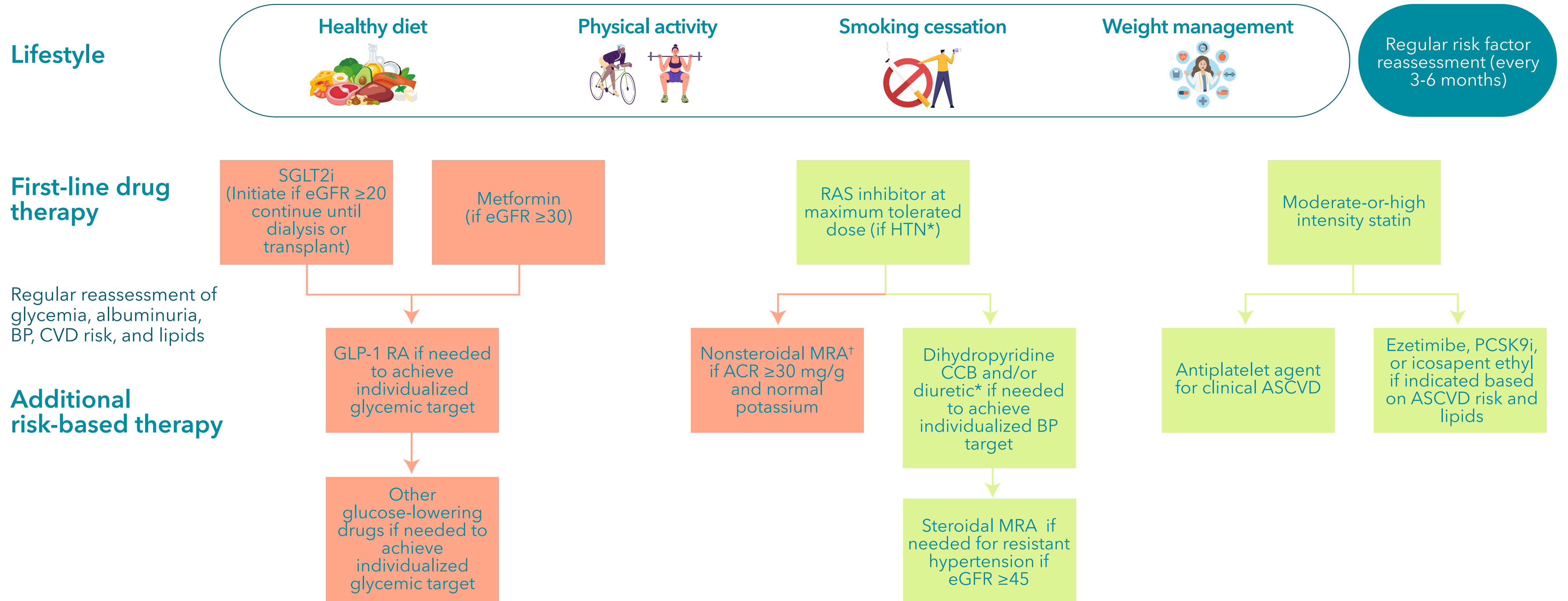
This CKD Heatmap serves as a guide for risk of CKD progression, frequency of visits, and referral to nephrology according to GFR and albuminuria. The numbers in each box indicate the frequency of screening or monitoring required per year.

CKD is classified based on:			Albuminuria categories (UACR mg/g)		
			Description and range		
Cause ©	GFR (G)	Albuminuria (A)	A1	A2	A3
			Normal to mildly increased	Moderately increased	Severely increased
			<30 mg/g <3 mg/mmol	30-299 mg/g 2-39 mg/mmol	≥300 mg/g ≥30 mg/mmol
G1	Normal or high	≥90	Screen 1	Treat 1	Treat and refer 3
G2	Mildly decreased	60-89	Screen 1	Treat 1	Treat and refer 3
G3a	Mildly to moderately decreased	45-59	Treat 1	Treat 2	Treat and refer 3
G3b	Moderately to severely decreased	30-44	Treat 2	Treat and refer 3	Treat and refer 3
G4	Severely decreased	15-29	Treat and refer* 3	Treat and refer* 3	Treat and refer 4+
G5	Kidney failure	<15	Treat and refer 4+	Treat and refer 4+	Treat and refer 4+

- No evidence of CKD based on eGFR or albuminuria. Screening should be conducted once a year.
- Moderate risk of CKD. Patients should receive treatment and suggested to be monitored once a year.
- High risk of CKD. Patients should receive treatment and suggested to be monitored twice in a year. In some cases (high UACR) patient should be monitored 3 times in a year and referral to a nephrologist is recommended.
- Very high risk of CKD. Patients should be monitored three or four or more times per year (i.e., every 1-3 months). Referral to a nephrologist is recommended for patients in this category.

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Holistic Approach For Improving Outcomes in Patients with Diabetes and CKD



Adapted from: de Boer, Ian H., et al. "Diabetes management in chronic kidney disease: a consensus report by the American Diabetes Association (ADA) and Kidney Disease: Improving Global Outcomes (KDIGO)." *Diabetes care* 45.12 (2022): 3075-3090.

ACEi or ARB should be first-line therapy for hypertension (HTN) if albuminuria is present. Or else, dihydropyridine calcium channel blocker or diuretic can also be considered; all three classes are often needed to for hypertension (HTN) treatment. † Finerenone is the only FDA approved ns-MRA currently."