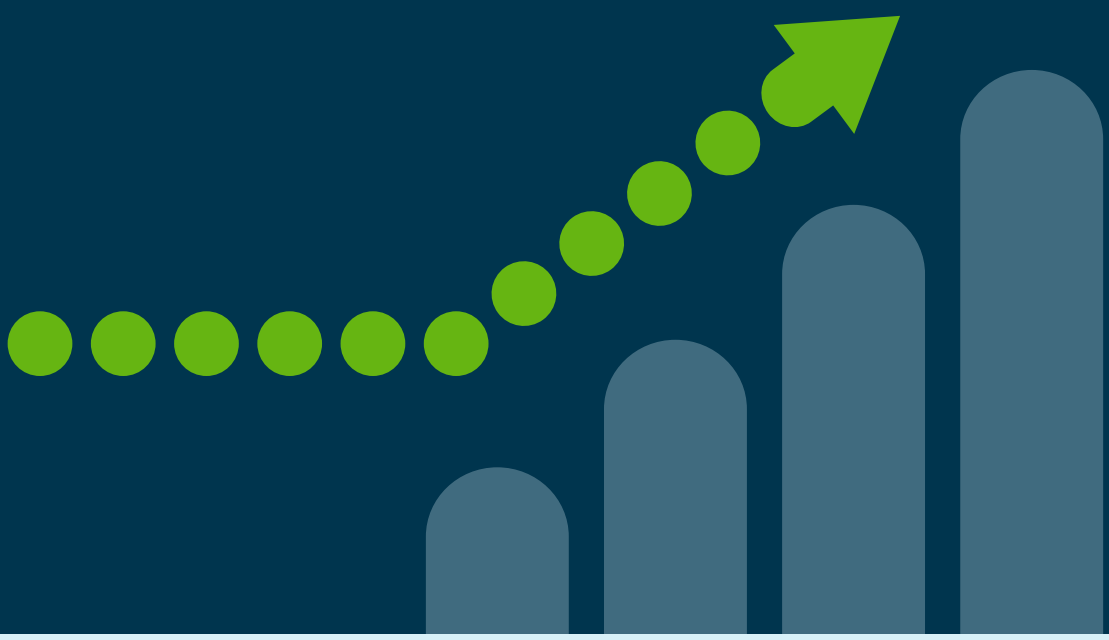
What we do now

CAN CHANGE THE TRAJECTORY OF CKD DIAGNOSIS



CHRONIC KIDNEY DISEASE

Associated With **TYPE 2 DIABETES**

SCREEN

RISK STRATIFY

TREAT

There is an urgent need
TO SCREEN, RISK STRATIFY, AND TREAT PATIENTS WITH CKD ASSOCIATED WITH T2D

IDENTIFICATION OF CKD

CKD is **underscreened** due to low patient/clinician awareness and screening barriers[1-5]

DIAGNOSIS

CKD is **underdiagnosed** in patients with T2D[6]

INTERVENTION (Lifestyle/Pharmacologic)

Standard of care[7] remains **underprescribed** in patients with CKD and diabetes[8]

CKD PROGRESSION

Disease progression may lead to kidney failure; however, patients are more likely to **die from a CV event** than to require dialysis or transplant[9]

CKD, chronic kidney disease**; CV,** cardiovascular**; T2D,** type 2 diabetes**.**

1. Centers for Disease Control and Prevention. Chronic Kidney Disease Surveillance System—United States. https://nccd.cdc.gov/CKD/detail.aspx?Qnum=Q98&Strat=Diabetes#refreshPosition. Accessed August 7, 2023. **2.** Stempniewicz N, et al. *Diabetes Care*. 2021;44:2000-2009. **3.** Alfego D, et al. *Diabetes Care*. 2021;44:2025-2032. **4.** Neale EP, et al. *BMC Nephrology*. 2020;21(1):83. **5.** Sperati CJ, et al. *PLoS One*. 2019;14(8):e0221325. **6.** Bakris G, et al. Presented at NKF 2019 Spring Clinical Meeting May 8-12, 2019. Poster. **7.** de Boer IH, et al. *Diabetes Care*. 2022;45(12):3075-3090. **8.** Centers for Disease Control and Prevention. Chronic Kidney Disease Surveillance System—United States. https://nccd.cdc.gov/ckd/detail.aspx?Qnum=Q605&Strat=Diabetes#refreshPosition. Accessed August 7, 2023. **9.** Dalrymple LS, et al. *J Gen Intern Med*. 2010;26(4):379-385.

CHRONIC KIDNEY DISEASE

CKD is defined as **ABNORMALITIES OF KIDNEY STRUCTURE OR FUNCTION FOR ≥3 MONTHS**[1,2]

FOR ≥3 MONTHS:

Persistent eGFR <60 mL/min/1.73 m²

OR

Persistent albuminuria (UACR ≥30 mg/g)

OR

Both

MORBIDITY and MORTALITY

Patients with early T2D and CKD stages 1-3 are at 83% greater risk of the composite of nonfatal MI, nonfatal stroke, or CV-related death compared with those with T2D alone[3,a]

More advanced CKD stages are associated with a higher risk of clinical events and faster eGFR decline,[4,5,b] with **CV mortality accounting for ~40% to 50% of all deaths** in patients with advanced CKD (stage 4) as well as ESKD (stage 5), compared with 26% in patients with normal kidney function[6]

[a]Results from a post hoc analysis of 12,174 participants from the ORIGIN study, aged ≥50 years old, with prediabetes or early T2D.[3] [b]Results from the Chronic Renal Insufficiency Cohort (CRIC) Study, which enrolled 3939 patients ages 21-74 years with eGFR 20-70 mL/min/1.73 m².[4]

CKD, chronic kidney disease; **CV**, cardiovascular; **eGFR**, estimated glomerular filtration rate; **ESKD**, end-stage kidney disease; **MI**, myocardial infarction; **T2D**, type 2 diabetes; **UACR**, urine albumin-to-creatinine ratio.

1. Kidney Disease Improving Global Outcomes. *Kidney Int Suppl*. 2013;3(1):1-150. **2.** de Boer IH, et al. *Diabetes Care*. 2022;45(12):3075-3090. **3.** Papademetriou V, et al. *Am J Med*. 2017;130(12):1465.e27-1465.e39. **4.** Grams ME, et al. *Nephrol Dial Transplant*. 2021;36(9):1685-1693. **5.** Grams ME, et al. Supplementary Appendix. *Nephrol Dial Transplant*. 2021;36(9):1685-1693. **6.** Jankowski J, et al. *Circulation*. 2021;143(11):1157-1172.

CHRONIC KIDNEY DISEASE

Early identification and treatment OF CKD ASSOCIATED WITH T2D CAN SLOW CKD PROGRESSION AND IMPROVE PATIENT OUTCOMES[1]

POTENTIAL BENEFITS OF EARLY SCREENING INCLUDE THE FOLLOWING:

1

Slow progression to ESKD through earlier detection and management[1]

2

Reduce risk of CV morbidity/ mortality[1]

3

Reduce healthcare costs[2,3]

CKD, chronic kidney disease**; CV,** cardiovascular**; ESKD,** end-stage kidney disease**; T2D,** type 2 diabetes**.**

1. Kidney Disease Improving Global Outcomes. *Kidney Int Suppl*. 2013;3(1):1-150. **2.** Yarnoff BO, et al. *BMC Nephrology*. 2017;18(1):85. **3.** Shlipak MG, et al. *Kidney Int*. 2021;99(1):34-47.

CHRONIC KIDNEY DISEASE

Guidelines recommend both eGFR and albuminuria

SCREENING AT LEAST ANNUALLY IN ALL PATIENTS WITH T2D[1-3]

WHEN TO SCREEN FOR CKD

Patients with **T1D duration ≥5 years** and **all patients with T2D** should be screened **at least annually** for CKD[1-3]

SCREENING TESTS

eGFR and **UACR**[1-3]

DIAGNOSIS

Persistent for **≥3 months**[2]**:**

eGFR <60 mL/min/1.73 m²

OR

UACR ≥30 mg/g[a]

OR

Both

[a]UACR has marked variability; therefore, a confirmatory urine sample within 3-6 months is recommended.[2]

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

1. American Diabetes Association. Section 11. *Diabetes Care*. 2023;46(Suppl 1):S191-S202. **2.** de Boer IH, et al. *Diabetes Care*. 2022;45(12):3075-3090. **3.** Blonde L, et al. *Endocr Pract*. 2022;28(10):923-1049.

CHRONIC KIDNEY DISEASE

Risk stratify

eGFR AND ALBUMINURIA ARE PREDICTIVE OF CKD PROGRESSION AND RISK FOR CV EVENTS

Risk of Progression, Frequency of Visits, and Referral to Nephrology According to eGFR and Albuminuria[a]

GFR categories, mL/min/1.73 m²			Albuminuria categories		
			A1	A2	A3
			Normal to mildly increased	Moderately increased	Severely increased
			<30 mg/g <3 mg/mmol	30-299 mg/g 3-29 mg/mmol	≥300 mg/g ≥30 mg/mmol
G1	Normal or high	≥90	Screen 1	Treat 1	Treat & Refer 3
G2	Mildly decreased	60-89	Screen 1	Treat 1	Treat & Refer 3
G3a	Mildly to moderately decreased	45-59	Treat 1	Treat 2	Treat & Refer 3
G3b	Moderately to severely decreased	30-44	Treat 2	Treat & Refer 3	Treat & Refer 3
G4	Severely decreased	15-29	Treat & Refer 3	Treat & Refer 3	Treat & Refer 4+
G5	Kidney failure	<15	Treat & Refer 4+	Treat & Refer 4+	Treat & Refer 4+

Low risk (if no other markers of kidney disease, no CKD) | Moderately increased risk | High risk | Very high risk

The heat map indicates the level of risk for CV events and progression of kidney disease by color intensity and the recommended frequency for monitoring UACR and eGFR

[a]The numbers in the boxes are a guide to the frequency of screening or monitoring (number of times per year). Green reflects no evidence of CKD by eGFR or albuminuria, with screening indicated once per year. For monitoring of prevalent CKD, suggested monitoring varies from once per year (yellow) to four times or more per year (ie, every 1-3 months, [deep red]) according to risks of CKD progression and CKD complications. These are general parameters only, based on expert opinion, and underlying comorbid conditions and disease state must be taken into account, as well as the likelihood of impacting a change in management for any individual patient.

CKD, chronic kidney disease; **CV**, cardiovascular; **eGFR**, estimated glomerular filtration rate; **GFR**, glomerular filtration rate; **UACR**, urine albumin-to-creatinine ratio.

de Boer IH, et al. *Diabetes Care*. 2022;45(12):3075-3090.

CHRONIC KIDNEY DISEASE

Treat patients with T2D associated with CKD

TO SLOW CKD PROGRESSION AND REDUCE THE RISK OF CV EVENTS[1]

Patients with diabetes and CKD should be treated with a comprehensive strategy to reduce risks of kidney disease progression and CV events[1]

Albuminuria categories

GFR categories, mL/min/1.73 m²			A1 Normal to mildly increased <30 mg/g <3 mg/mmol	A2 Moderately increased 30-299 mg/g 3-29 mg/mmol	A3 Severely increased ≥300 mg/g ≥30 mg/mmol
G1	Normal or high	≥90	Screen 1	Treat 1	Treat & Refer 3
G2	Mildly decreased	60-89	Screen 1	Treat 1	Treat & Refer 3
G3a	Mildly to moderately decreased	45-59	Treat 1	Treat 2	Treat & Refer 3
G3b	Moderately to severely decreased	30-44	Treat 2	Treat & Refer 3	Treat & Refer 3
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G5	Kidney failure	<15	Treat & Refer 4+	Treat & Refer 4+	Treat & Refer 4+

Low risk (if no other markers of kidney disease, no CKD) | Moderately increased risk | High risk | Very high risk

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1. Shlipak MG, et al. *Kidney Int*. 2021;99(1):34-47. **2.** de Boer IH, et al. *Diabetes Care*. 2022;45(12):3075-3090.

CHRONIC KIDNEY DISEASE

ADA 2023 guidelines recommend **REDUCING ALBUMINURIA LEVELS TO SLOW CKD PROGRESSION**

ADA STANDARDS OF MEDICAL CARE IN DIABETES

2023 Treatment Recommendation

Recommendation 11.6–In patients with CKD who have ≥300 mg/g urinary albumin, **a reduction of 30% or greater in mg/g urinary albumin is recommended** to slow CKD progression (B)

Target

30%

Reduction

ADA, American Diabetes Association; **CKD**, chronic kidney disease.

American Diabetes Association. Section 11. *Diabetes Care*. 2023;46(Suppl 1):S191-S202.

CHRONIC KIDNEY DISEASE