Chronic Kidney Disease (CKD) Associated With Type 2 Diabetes (T2D)

Reduce Kidney and CV Risk Through Appropriate Testing, Diagnosis, and Treatment

CKD Associated With T2D Is a Major Population Health Concern

In the United States, there are **~36.4 million** people with T2D[1]

Up to **40%** of patients with T2D have CKD[2]

Despite this high prevalence, **~90%** of patients with diabetes and CKD are unaware of their kidney disease[3*]

According to the Centers for Disease Control and Prevention, **CKD is more common in non-Hispanic Blacks (16.3%)** and **Hispanics (13.6%)** than in non-Hispanic Whites (12.7%) or non-Hispanic Asians (12.9%)[4]

Incidence of Costly CV Events Increases Substantially in Patients With CKD Associated With T2D vs Those With T2D Alone

Incidence of CV Events in Patients With CKD Associated With T2D vs T2D alone

- **~2x** more Myocardial infarction (MI) cases[5†]
- **~3-6x** greater risk of Hospitalization due to heart failure (HHF)[6‡]
- **~3x** more Cardiovascular (CV) deaths[7§]

Cost of CV Events in Patients With CKD Associated With T2D (2023 USD)[6,8,9‖]

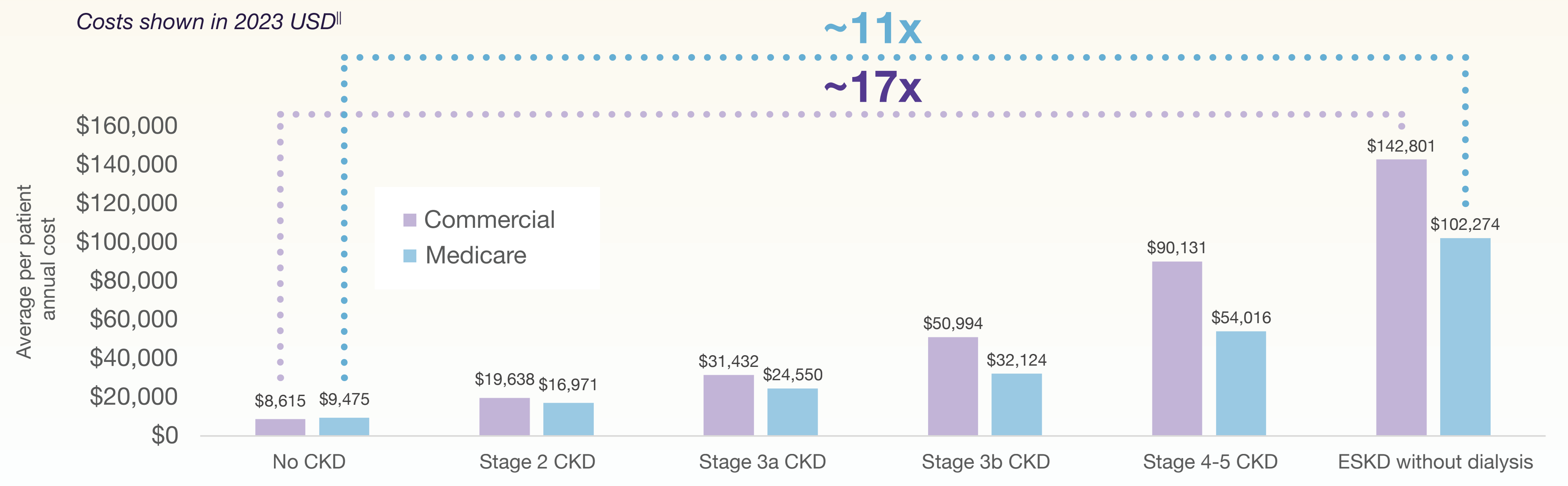
- **ANNUALIZED MI: $26,193**
- **ANNUALIZED HHF: $43,053**
- **1-MONTH COST** CV-related death **$17,917**

CKD Progression Exponentially Increases Costs for Commercial and Medicare Patients, Including Those With T2D

COST OF CARE FOR *COMMERCIAL* AND *MEDICARE* PATIENTS[9,10¶]

Diabetes was present in 38% of commercially insured and 42% of Medicare study participants with CKD[10]

Costs shown in 2023 USD[‖]



Patient Outcomes Can Be Improved Through Appropriate Testing, Diagnosis, and Guideline-Directed Medical Therapy (GDMT)

INSUFFICIENT TESTING

>94% eGFR[11]

38.7% UACR[11]

According to the ADA, AACE, ESC, and KDIGO, **UACR and eGFR should be performed at least once per year** in members with T2D.[12-16] However, **CKD screening rates remain too low**[11#]

LACK OF DIAGNOSIS

Patients may have lab-indicated CKD without corresponding diagnosis codes

Nearly 75% of Medicare Advantage patients with lab-indicated CKD did not have a corresponding diagnosis code[17]

REDUCED CARE QUALITY

The HEDIS® quality measure evaluates the performance of UACR and eGFR tests in patients with diabetes[18]

Performance on this measure is now included in Medicare and NCQA Star Ratings[18,19]

Low testing rates indicate **failure to achieve this HEDIS measure**[11,18]

Guideline-Directed Medical Therapies for CKD Associated With T2D Are Broadly Underutilized

Clinical practice guidance from the ADA, AACE, ESC, and KDIGO recommend the use of pharmacotherapies to reduce risk in patients with CKD associated with T2D, although real-world data in diagnosed patients show that use is insufficient and there is unchecked disease progression for patients with CKD associated with T2D[11-16,20]

- **30%** No GDMT[20]
- **41%** ACEi/ARB only[20]
- **19%** ACEi/ARB + additional GDMT[20]

AAKP has indicated that access barriers prevent patients from receiving evidence-based treatments in kidney healthcare[21]

A recent analysis of treatments for CKD associated with T2D found that **94% of patients are not gaining access** to more recently approved therapies indicated to reduce risks of renal and cardiovascular outcomes, with the **largest obstacle being restrictions in payer coverage**[22]

Clinical and Economic Outcomes for Patients With CKD Associated With T2D Can Be Improved Through: Evidence-Based Kidney Health Testing of eGFR and UACR, Timely Diagnosis, and Optimized Guideline-Directed Treatments

*Estimates of diabetes may not delineate between type 1 and type 2 diabetes. According to the American Diabetes Association, T2D accounts for 90%-95% of all diabetes cases. Therefore, statistics that describe diabetes may be more characteristic of T2D.[13]

†As evidenced by a cross-sectional analysis of self-reported patient data collected between 2007 and 2012 from 2,006 patients with type 2 diabetes who completed NHANES.[5]

‡Randomized, double-blind, placebo-controlled SAVOR TIMI 53 trial conducted from 2010-2013 in 16,492 patients with T2D and a glycated hemoglobin (HbA1c) of 6.5%-12.0% within 6 months of randomization and either a history of atherosclerotic cardiovascular disease (ASCVD) or multiple cardiovascular disease (CVD) risk factors. Baseline UACR was available in 15,760 patients.[6]

§This study used data from NHANES III participants aged ≥20 years, who participated in a health examination and had available data on medications used, serum creatinine, and urine albumin and creatinine concentrations. Of these, the only participants who were included were those who had follow-up mortality data through 2006 (15,046 of 15,762 of NHANES III participants, 95.5%); 1,430 (9.5%) of the 15,046 participants had T2D.[7]

‖Costs inflated to 2023 USD using MCPI from the US Bureau of Labor Statistics. MCPI from Half 2 of relevant years used in calculations. Difference of MCPI 2023 (Half 1) and originating MCPI was taken and divided by originating MCPI, and then multiplied by 100 to generate inflation factor percentage. Inflation factor percentage was multiplied by originating cost to generate inflated cost in 2023 USD. Values rounded to nearest dollar.[9]

¶Based on a study conducted between 2007 and 2012 that analyzed all-cause, prescription, outpatient, emergency department, and inpatient costs according to CKD stage. Diabetes present in 38% and 42% of commercial and Medicare participants, respectively. Sample sizes (n) for the cohorts in this study are as follows: No CKD (Medicare: 4,586; commercial: 52,175); Stage 2 (Medicare: 43,024; commercial: 28,540); Stage 3a (Medicare: 15,001; commercial: 6,315); Stage 3b (Medicare: 12,651; commercial: 3,963); Stages 4-5 (Medicare: 10,014; commercial: 3,734); end-stage kidney disease without dialysis (Medicare: 1,440; commercial: 1,197).[10]

#As evidenced by a retrospective analysis of 101,057 patients with CKD associated with T2D across the US who had data in the Optum® Clinformatics® database. Investigators sought to evaluate eGFR and UACR testing rates over a 1-year period.[11]

AACE, American Association of Clinical Endocrinology; AAKP, American Association of Kidney Patients; ACEi, angiotensin-converting enzyme inhibitor; ADA, American Diabetes Association; ARB, angiotensin receptor blocker; eGFR, estimated glomerular filtration rate; ESC, European Society of Cardiology; ESKD, end-stage kidney disease; HEDIS, Healthcare Effectiveness Data and Information Set; KDIGO, Kidney Disease: Improving Global Outcomes; MCPI, Medical Care Price Index; NHANES, National Health and Nutrition Examination Survey; UACR, urinary albumin-to-creatinine ratio; USD, US dollars.

HEDIS® is a registered trademark of the National Committee for Quality Assurance (NCQA).

References: 1. Statistics about diabetes. American Diabetes Association. Accessed March 18, 2024. https://diabetes.org/about-diabetes/statistics/about-diabetes **2.** Bailey RA, Wang Y, Zhu V, Rupnow MFT. Chronic kidney disease in US adults with type 2 diabetes: an updated national estimate of prevalence based on Kidney Disease: Improving Global Outcomes (KDIGO) staging. *BMC Res Notes*. 2014;7:415. **3.** United States Renal Data System. 2020 USRDS annual data report. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2020. Accessed March 18, 2024. https://usrds-adr.niddk.nih.gov/2020/chronic-kidney-disease/1-ckd-in-the-general-population **4.** Chronic kidney disease in the United States, 2021. Centers for Disease Control and Prevention. Accessed March 18, 2024. https://nccd.cdc.gov/CKD/Documents/Chronic-Kidney-Disease-in-the-US-2021-h.pdf **5.** Wu B, Bell K, Stanford A, et al. Understanding CKD among patients with T2DM: prevalence, temporal trends, and treatment patterns–NHANES 2007-2012. *BMJ Open Diabetes Res Care*. 2016;4(1):e000154. **6.** Scirica BM, Mosenzon O, Bhatt DL, et al. Cardiovascular outcomes according to urinary albumin and kidney disease in patients with type 2 diabetes at high cardiovascular risk: observations from the SAVOR-TIMI 53 trial. *JAMA Cardiol*. 2018;3(2):155-163. **7.** Afkarian M, Sachs MC, Kestenbaum B, et al. Kidney disease and increased mortality risk in type 2 diabetes. *J Am Soc Nephrol*. 2013;24(2):302-308. **8.** Betts KA, Song J, Faust E, et al. Medical costs for managing chronic kidney disease and related complications in patients with chronic kidney disease and type 2 diabetes. *Am J Manag Care*. 2021;27(20 suppl):S369-S374. **9.** U.S. Bureau of Labor Statistics. Databases, tables & calculators by subject. Accessed March 18, 2024. https://data.bls.gov/timeseries/CUUR0000SAM?output_view=data **10.** Golestaneh L, Alvarez PJ, Reaven NL, et al. All-cause costs increase exponentially with increased chronic kidney disease stage. *Am J Manag Care*. 2017;23(suppl 10): S163-S172. **11.** Betts KA, Song J, Elliott J, et al. Geographical variation in kidney function testing and associations with health care costs among patients with chronic kidney disease and type 2 diabetes. *Am J Manag Care*. 2022;28(6 suppl):S112-S119. **12.** de Boer IH, Khunti K, Sadusky T, 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*. 2022;45(12):3075-3090. **13.** American Diabetes Association. Standards of care in diabetes—2024. *Diabetes Care*. 2024;47(suppl 1):S1-S321. **14.** Marx N, Federici M, Schütt K, et al; for the ESC Scientific Document Group. 2023 ESC Guidelines for the management of cardiovascular disease in patients with diabetes. *Eur Heart J*. 2023;44(39):4043-4140. **15.** Kidney Disease Improving Global Outcomes. KDIGO 2022 clinical practice guideline for diabetes management in chronic kidney disease. *Kidney Int*. 2022;102(5S):S1-S127. **16.** Blonde L, Umpierrez GE, Reddy SS, et al. American Association of Clinical Endocrinology clinical practice guideline: developing a diabetes mellitus comprehensive care plan–2022 update. *Endocr Pract*. 2022;28(10):923-1049. **17.** Chronic kidney disease often undiagnosed in Medicare beneficiaries. Centers for Medicare & Medicaid Services. Updated September 2021. Accessed March 18, 2024. https://www.cms.gov/files/document/ckd-data-highlight102020-2.pdf **18.** Kidney health evaluation for patients with diabetes (KED). National Committee for Quality Assurance. Accessed March 18, 2024. https://www.ncqa.org/hedis/measures/kidney-health-evaluation-for-patients-with-diabetes **19.** Medicare 2024 Part C & D Star Ratings Technical Notes. Centers for Medicare & Medicaid Services. Accessed March 18, 2024. https://www.cms.gov/files/document/2024technotes20230929.pdf **20.** Data on file. Bayer. **21.** Kidney patients cite insurance and payment issues as critical barriers to FDA approved care innovations. American Association of Kidney Patients. Accessed March 18, 2024. https://aakp.org/kidney-patients-cite-insurance-and-payment-issues-as-critical-barriers-to-fda-approved-care-innovations%EF%BF%BC/ **22.** The impact of payer access controls in chronic kidney disease for patients with type II diabetes. IQVIA. Accessed March 18, 2024. https://www.iqvia.com/locations/united-states/blogs/2022/03/impact-of-payer-access-controls-chronic-kidney-disease-patients-type-ii-diabetes