The Whole Kidney and Caboodle: Incorporating Guideline-Based Recommendations to Identify and Manage Chronic Kidney Disease and Reduce Cardiovascular Risks

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The following persons in control of this activity's content have relevant financial relationships:

- Katie Cardone: Merck & Co. – Sub-investigator; GE Healthcare – Co-principal investigator; GSK – Advisory Board

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Learning Objectives

- Apply guideline recommendations to identify and screen patients at risk of CKD using both uACR and eGFR to provide early identification, early access to treatment, and reduce the risk of kidney disease progression and adverse cardiovascular outcomes.
- Analyze guideline-based recommendations and clinical evidence for current and emerging therapies to reduce the risk for CKD progression as well as cardiovascular risks.
- Prioritize opportunities within healthcare systems to bridge care and provide holistic, individualized care for people at risk for/with CKM syndrome.

Abbreviations

- ACE-I: Angiotensin converting enzyme inhibitor
- AKI: Acute kidney injury
- ARB: Angiotensin receptor blocker
- ASI: Aldosterone Synthase Inhibitor
- CKM: Cardiovascular – Kidney – Metabolic
- DKA: Diabetic Ketoacidosis
- DKD: Diabetic Kidney Disease
- EGFR: Estimated glomerular filtration rate
- GIP: Gastric inhibitory polypeptide
- GLP-1 RA: glucagon-like peptide-1 receptor agonist
- KDIGO: Kidney Disease Improving Global Outcomes
- KRT: Kidney Replacement Therapy
- MDRD: Modification of Diet in Renal Disease Study
- ns-MRA: Nonsteroidal mineralocorticoid antagonist
- NT-proBNP: N-terminal prohormone of brain natriuretic peptide
- RAASi: Renin Angiotensin Aldosterone System Inhibitor
- RAS: Renin Angiotensin System
- SGLT2i: Sodium-glucose cotransporter 2 inhibitors
- uACR: Urinary albumin to creatinine ratio

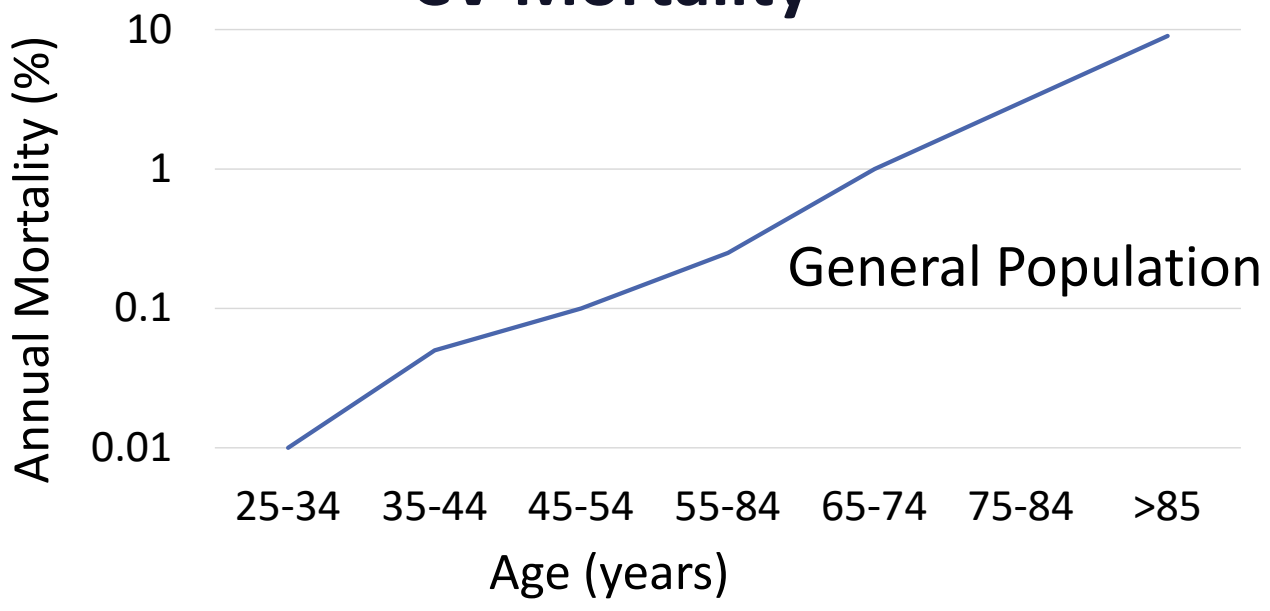
Setting the Stage

Kidney disease is associated with high morbidity and mortality.

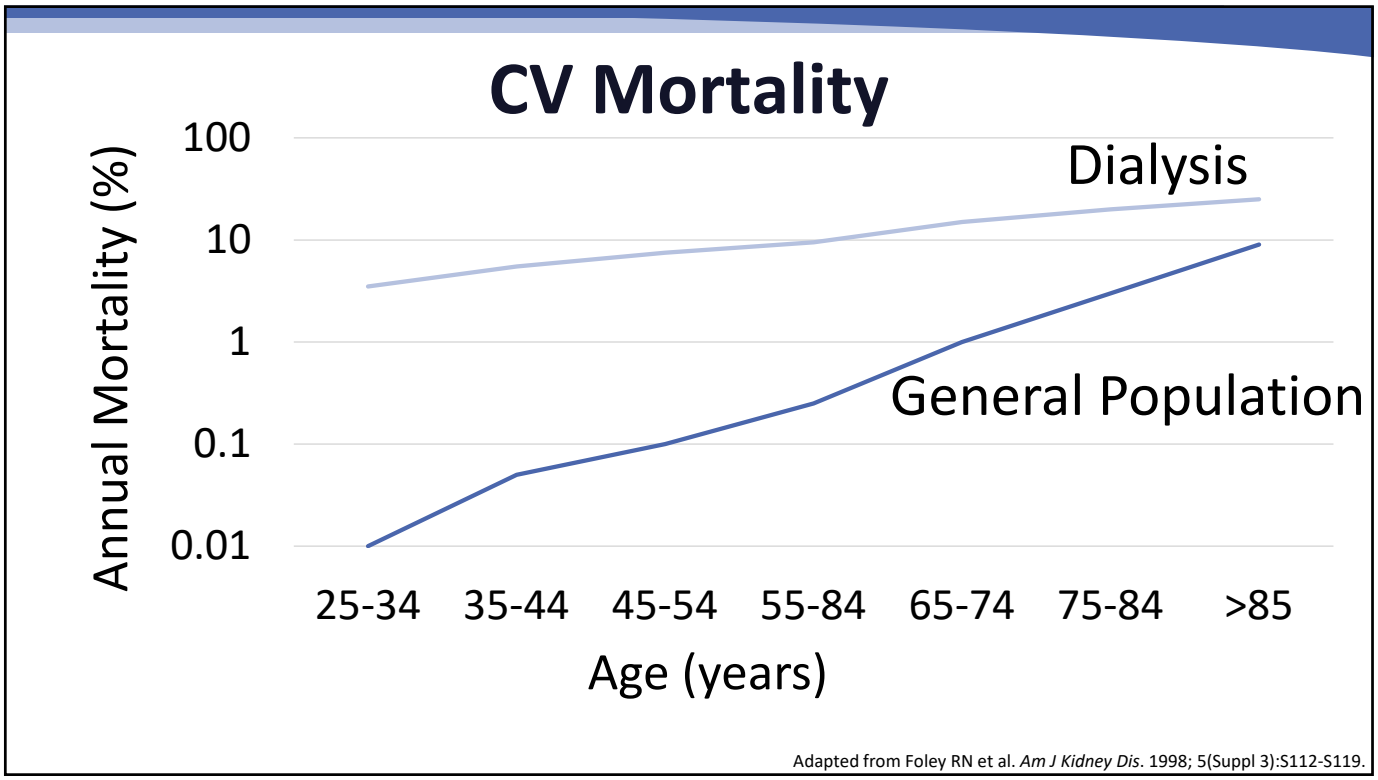
We have medications that save lives!

Many people who could benefit from these medications are not receiving them!

CV Mortality



Adapted from Foley RN et al. *Am J Kidney Dis.* 1998; 5(Suppl 3):S112-S119.



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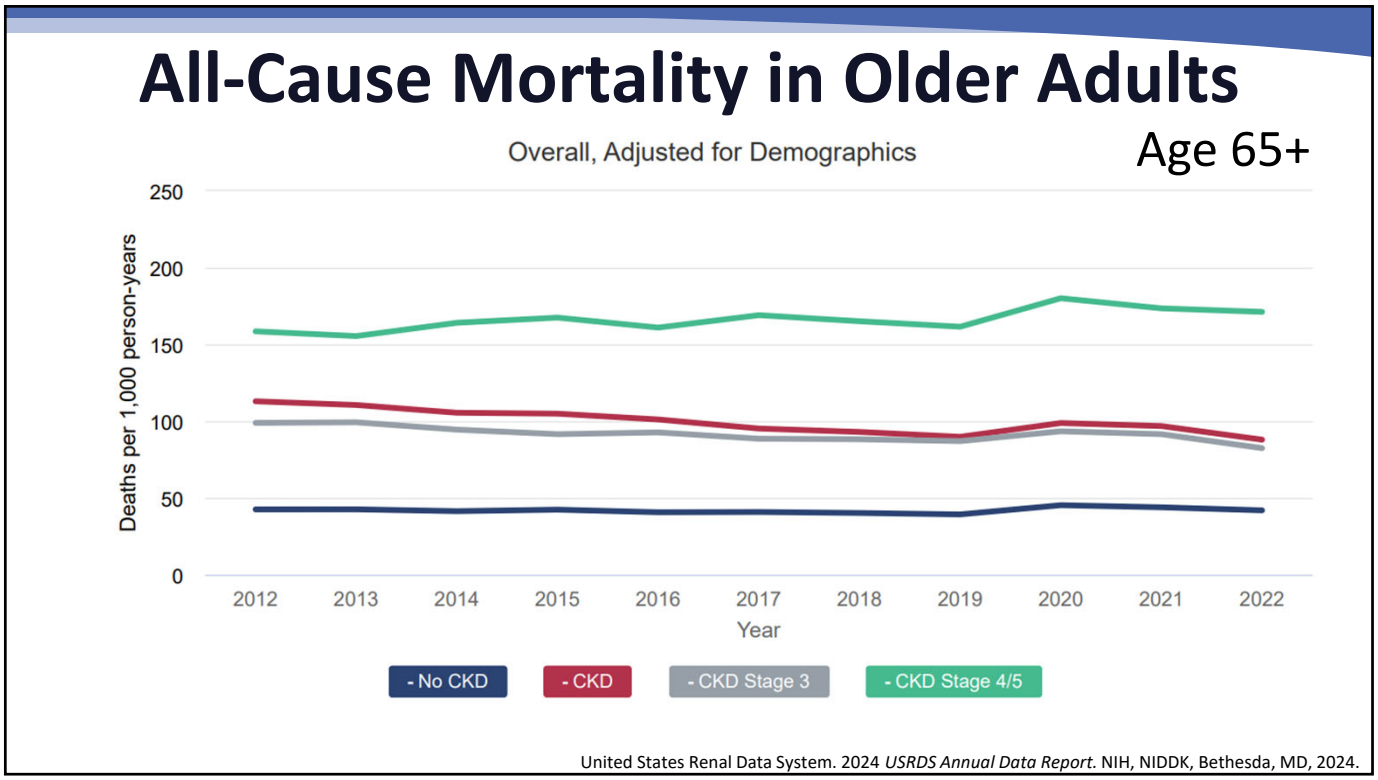
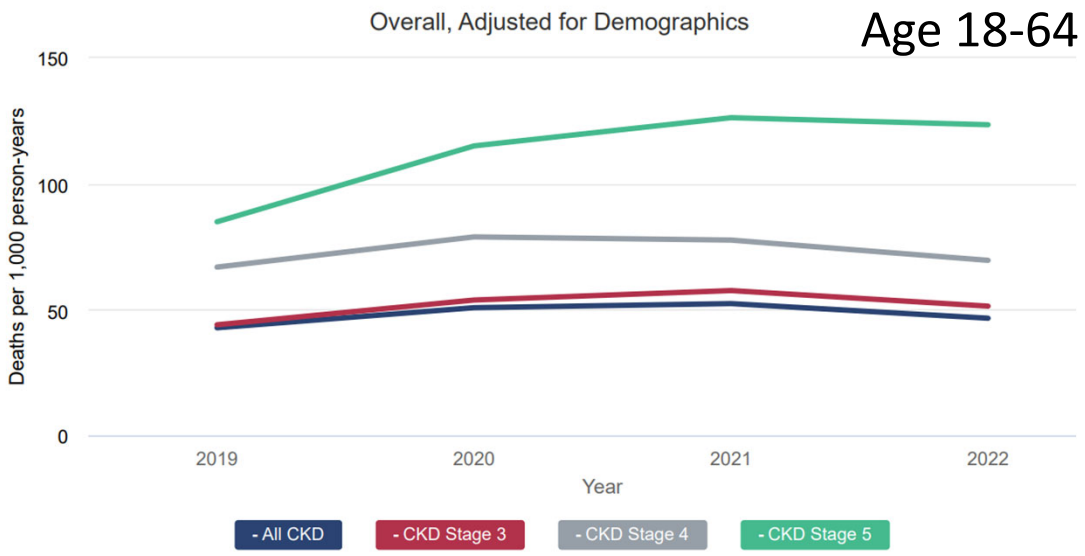


United States Renal Data System. 2024 *USRDS Annual Data Report*. NIH, NIDDK, Bethesda, MD, 2024.

All-Cause Mortality in Younger Adults



United States Renal Data System. 2024 *USRDS Annual Data Report.* NIH, NIDDK, Bethesda, MD, 2024.

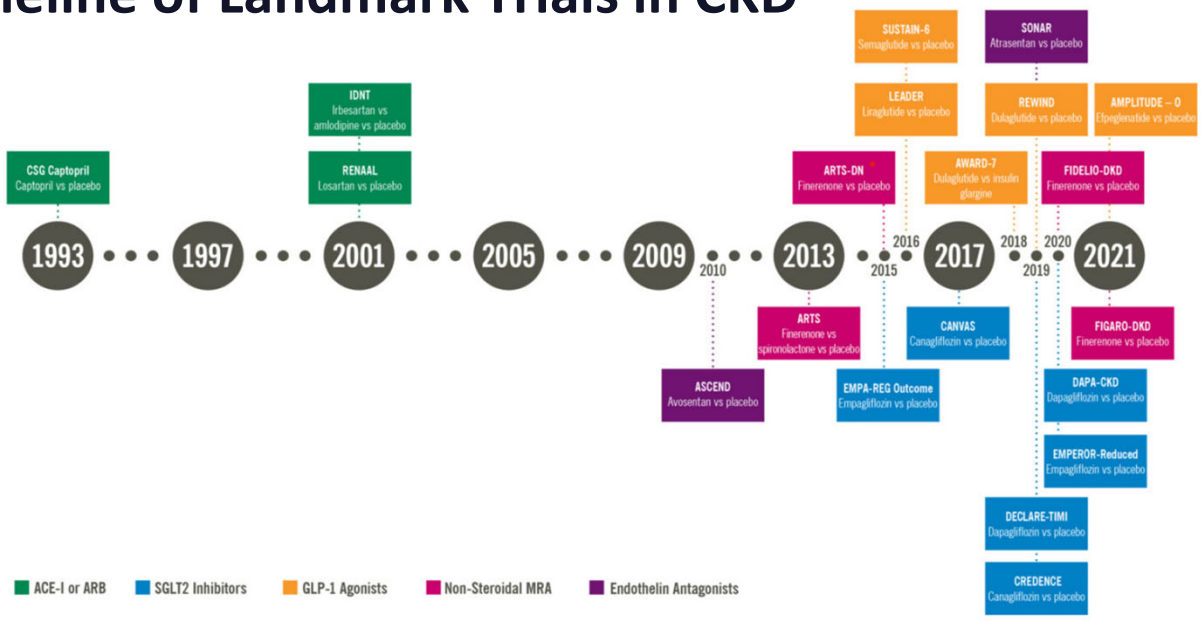
Setting the Stage

Kidney disease is associated with high morbidity and mortality.

We have medications that:

1. Save lives
2. Protect against CV events
3. Prevent kidney failure

Timeline of Landmark Trials in CKD



Sawaf H et al. *J Clin Med*. 2022; 11:378.

Setting the Stage

Kidney disease is associated with high morbidity and mortality.

We have medications that save lives!

Many people who could benefit from these medications are not receiving them!

Medication Care Gaps in CKD

- Study of 23 integrated primary care sites
- Jan 2021-Jan 2022
- N=7199 patients with DKD
  - Age 18+
  - T2D
  - uACR >30 mg/g
  - No kidney failure

Care Gaps Identified
RAASi: 42%
SGLT2i: 80.3%

Rikin S et al. *J Gen Intern Med*. 2022; 38(7):1599-1605.

Learning Objectives

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3. Prioritize opportunities within healthcare systems to bridge care and provide holistic, individualized care for people at risk for/with CKM syndrome.

Chronic Kidney Disease (CKD)

Definition

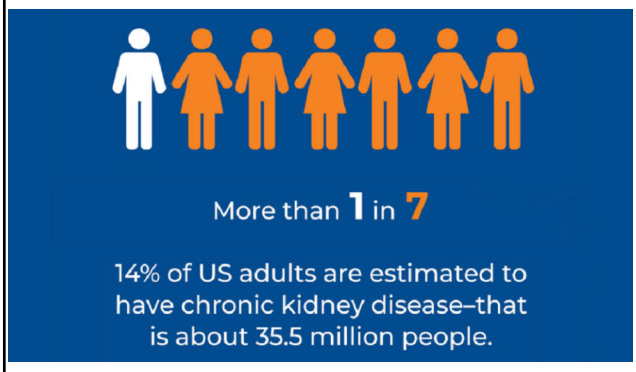
"CKD is defined as abnormalities of kidney structure or function, present for a minimum of 3 months, with implications for health."

Classification (CGA)

- Cause
- GFR category (G1–G5)
- Albuminuria category (A1–A3)

Kidney Int. 2024; 105(4S):S117-S314.

CKD is a Public Health Concern



CKD is associated with significant mortality and morbidity.

- Increased risk of CV events
- May lead to need for kidney transplant or dialysis

Healthy People 2030

- Goal: Reduce the burden of chronic kidney disease and related complications
  - 14 objectives related to CKD

US Department of HHS. Healthy People 2030. https://health.gov/healthypeople/objectives-and-data/browse-objectives/chronic-kidney-disease (accessed 2025 Oct 25).

US Department of HHS, Centers for Disease Control and Prevention. Chronic Kidney Disease in the United States, 2023. https://www.cdc.gov/kidney-disease/php/data-research/index.html (accessed 2025 Oct 25).

Progression of CKD by GFR and Albuminuria Categories

GFR categories (ml/min/1.73m²) Description and range				Albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-299 mg/g 3-29 mg/mol	≥300 mg/g ≥30 mg/mmol
	G1	Normal to high	≥90			
	G2	Mildly decreased	60-90			
	G3a	Mildly to moderately decreased	45-59			
	G3b	Moderately to severely decreased	30-44			
	G4	Severely decreased	15-29			
	G5	Kidney failure	15			

Green: low risk (if no other markers of kidney diseases, no CKD); Yellow: moderately increased risk; Orange: high risk; Red, very high risk

Jankowski J et al. *Circulation*. 2021; 143(11): 1157-1172.

CKD Missed Opportunities

Hope in CKD

Medications can slow CKD progression and prevent **CV events**

Many people don't know they have CKD.

CKD often goes **undiagnosed**

"Silent Killer"

Gaps in care exist

Lost opportunities lead to **real consequences**

Missed cases = Missed chances to protect lives

Screening and Testing

- Systematically test people with risk factors for early detection and intervention
  - Hypertension, diabetes, CVD (including heart failure)
  - AKI
- Population-wide screening of uACR could be cost-effective in the US.
- Public health approach

Kidney Int. 2024; 105(4S):S117-S314.
Cusick MM et al. *Ann Intern Med*. 2023; 176:788-797.

Two Screening Tests

GLOMERULAR FILTRATION RATE

URINARY ALBUMIN TO CREATININE RATIO

Kidney Int. 2024; 105(4S):S117-S314.

Two Screening Tests

GLOMERULAR FILTRATION RATE

URINARY ALBUMIN TO CREATININE RATIO

Kidney Int. 2024; 105(4S):S117-S314.

Test #1: Glomerular Filtration Rate

Diagnosis

- CKD
- G category

Treatment

- Referrals (to nephrologist, for transplant, dialysis access)
- Education interventions
- Progression monitoring
- Medication use and dosing
- Clinical trial eligibility

Assessing Risk

- CKD complications
- CKD progression
- CVD
- Mortality
- Medication errors
- Fertility and pregnancy risk

Kidney Int. 2024; 105(4S):S117-S314.

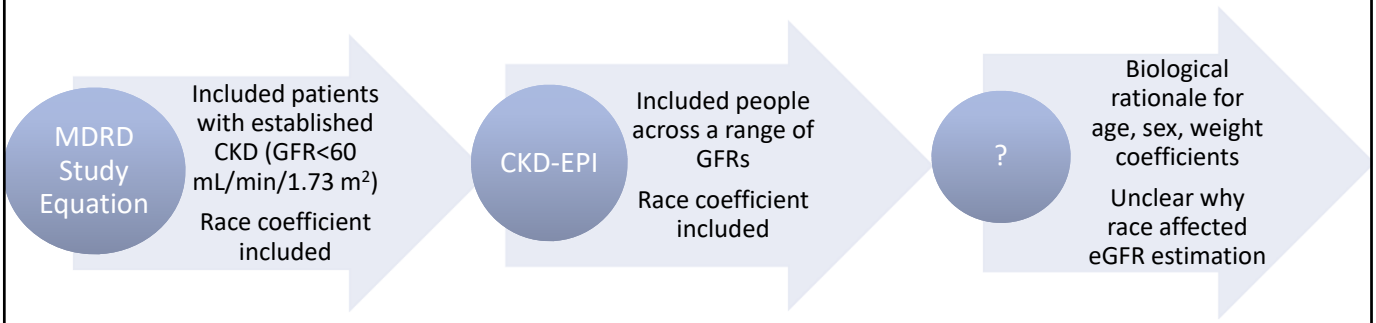
Test #1: Glomerular Filtration Rate

KDIGO 2024 Recommendations

- Use creatinine-based eGFR ($eGFR_{cr}$)
- If cystatin C is available, use the combined equation ($eGFR_{cr\text{-}cys}$).
- Use a validated eGFR equation
- Inclusion of race in the eGFR equation should be avoided.

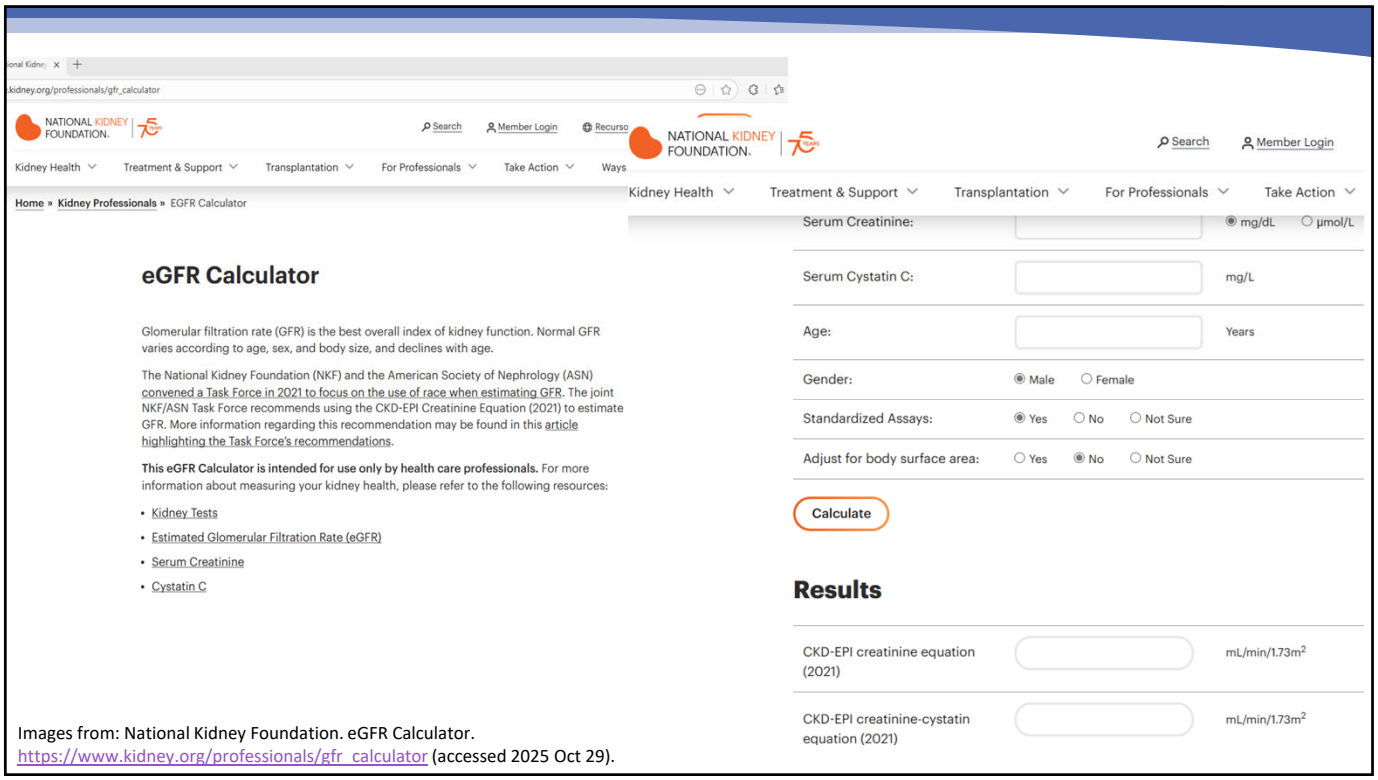
Kidney Int. 2024; 105(4S):S117-S314.

Equations Used to Estimate GFR



Race is a social category; captures diverse ancestral backgrounds, social determinants of health, other factors

Delgado C et al. *Am J Kidney Dis*. 2021; 78:103-115.



Images from: National Kidney Foundation. eGFR Calculator. https://www.kidney.org/professionals/gfr_calculator (accessed 2025 Oct 29).

Two Screening Tests

GLOMERULAR FILTRATION RATE

URINARY ALBUMIN TO CREATININE RATIO

Kidney Int. 2024; 105(4S):S117-S314.

Test #2: Urinary Albumin to Creatinine Ratio

Diagnosis	Treatment	Assessing Risk
• CKD • A category	• Referrals (to nephrologist) • Education interventions • Progression monitoring • Clinical trial eligibility	• CKD progression • CVD • Mortality • Fertility and pregnancy risk

Kidney Int. 2024; 105(4S):S117-S314

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Kidney damage must be present for G1 and G2.

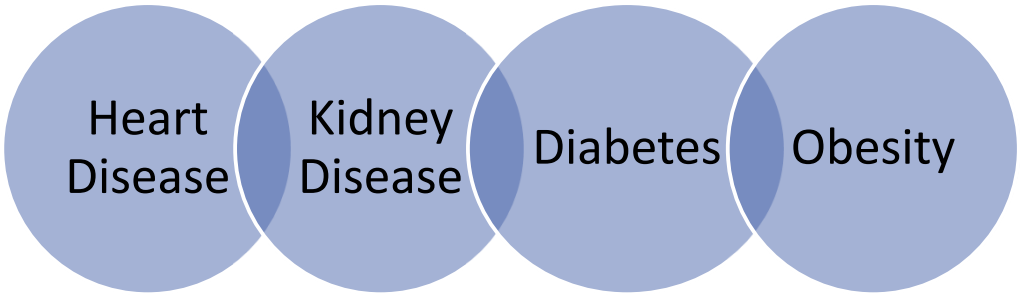
Jankowski J et al. *Circulation*. 2021; 143(11): 1157-1172..

CKM Syndrome Defined

- "A health disorder attributable to connections among obesity, diabetes, CKD, and CVD, including heart failure, atrial fibrillation, coronary heart disease, stroke, and peripheral artery disease"
- "CKM syndrome includes those at risk for CVD and those with existing CVD."

Ndumele CE et al. *Circulation*. 2023; 148:1606-1635.

Cardiovascular-Kidney-Metabolic (CKM) Syndrome



3 out of 4 U.S. adults have reversible CKM syndrome

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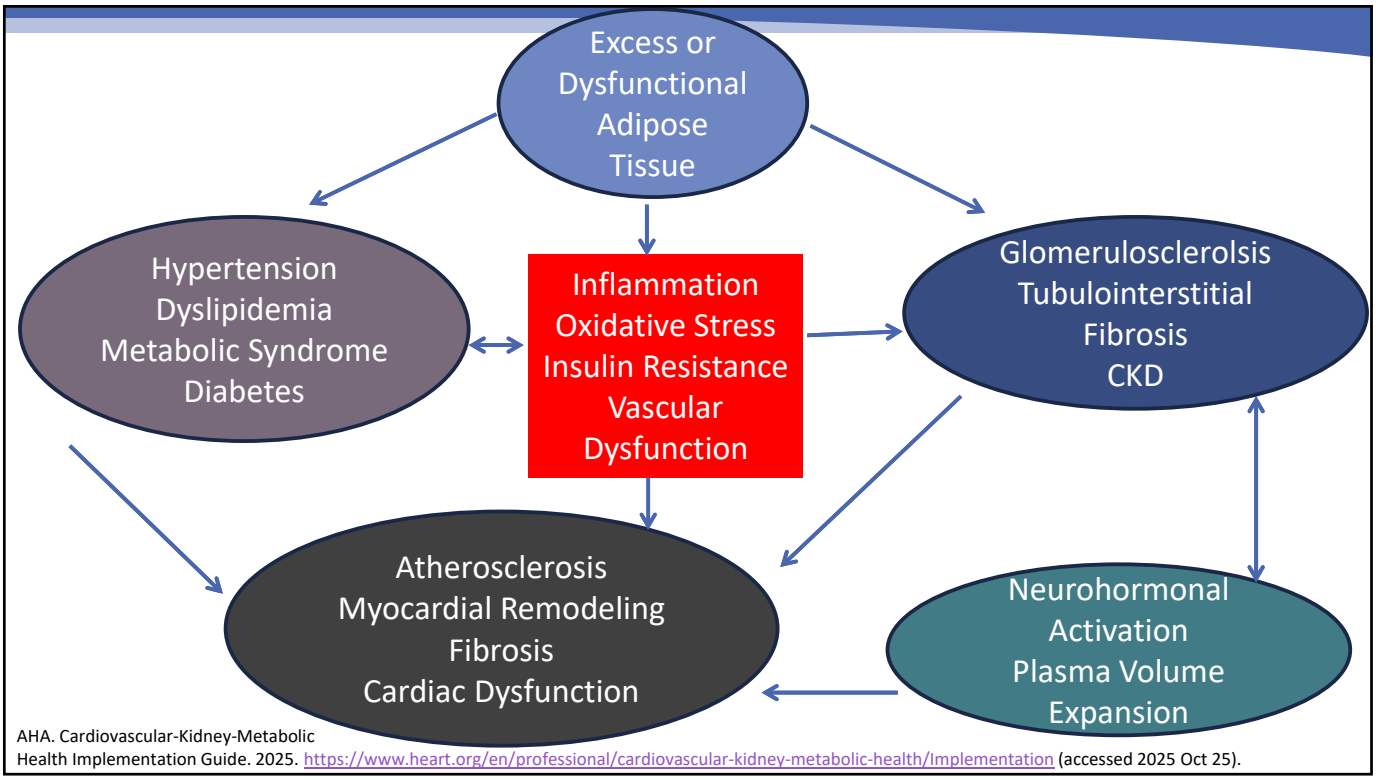

AHA. Cardiovascular-Kidney-Metabolic Health Implementation Guide. 2025. https://www.heart.org/en/professional/cardiovascular-kidney-metabolic-health/Implementation (accessed 2025 Oct 25).

Stages of CKM Syndrome

Stage 0: No Risk Factors	Stage 1: Dysfunctional Adipose Tissue	Stage 2: Metabolic Risk Factors and CKD	Stage 3: Subclinical CVD	Stage 4: Clinical CVD
• Prevention • Preserve CV health	• Overweight/ obesity; abdominal obesity • Impaired glucose tolerance	• Metabolic syndrome • HTN • Hypertriglyceridemia • T2DM • Moderate-to-high risk CKD	• Subclinical ASCVD & HF • Very high-risk CKD (G4/G5 or per KDIGO heat map), • High predicted CVD risk	• CHD • HF • Stroke • Afib • PAD • 4a (no kidney failure) • 4b (kidney failure)

Ndumele CE et al. *Circulation*. 2023; 148:1606-1635.

American Heart Association PREVENT Online Calculator

- Calculates 10-year and 30-year CVD risk
- Includes calculations for Total CVD, ASCVD, and Heart Failure risk
- Use for adults aged 30-79
- Do not use for patients with:
  - Known CVD
  - Severe subclinical CVD
  - Genetic variant / inherited CV condition
  - Kidney failure
  - Life expectancy less than 1 year

American Heart Association. PREVENT Online Calculator. https://professional.heart.org/en/guidelines-and-statements/prevent-calculator (accessed 2025 Oct 25).

PREVENT Required Fields

- Sex (M/F)
- Age (30-79 years)
- Total Cholesterol (130-320 mg/dL)
- Diabetes history (yes/no)
- Current Smoking (any smoking in the last 30 days?, yes/no)
- HDL Cholesterol (20-100 mg/dL)
- SBP (90-200 mmHg)
- Anti-hypertensive medication (current use?, yes/no)
- Lipid-lowering medication (current use?, yes/no)
- BMI (18.5-39.9 kg/m^2)
- eGFR (15-140 mL/min/1.73m^2)

American Heart Association. PREVENT Online Calculator. https://professional.heart.org/en/guidelines-and-statements/prevent-calculator (accessed 2025 Oct 25).

PREVENT Optional Fields

- uACR (0-25000mg/g)
- HgbA1C (3-15%)
- Zip Code (to estimate social deprivation index)

American Heart Association. PREVENT Online Calculator. https://professional.heart.org/en/guidelines-and-statements/prevent-calculator (accessed 2025 Oct 25).

Risk-Enhancing Factors for CKM Syndrome

CHRONIC INFLAMMATORY CONDITIONS
e.g., psoriasis, RA, lupus, HIV/AIDS

HIGH-RISK DEMOGRAPHIC GROUPS
e.g., South Asian ancestry, lower socioeconomic status

HIGH BURDEN OF ADVERSE SDoH

MENTAL HEALTH DISORDERS
e.g., depression and anxiety

SLEEP DISORDERS
e.g., obstructive sleep apnea

SEX-SPECIFIC RISK ENHANCERS
- History of premature menopause (age < 40 years)
- History of adverse pregnancy outcomes
- Polycystic ovarian syndrome
- Erectile dysfunction

ELEVATED HIGH-SENSITIVITY C-REACTIVE PROTEIN

FAMILY HISTORY OF KIDNEY FAILURE; FAMILY HISTORY OF DIABETES

Ndumele et al. Circulation 2023; 148:1606-35.

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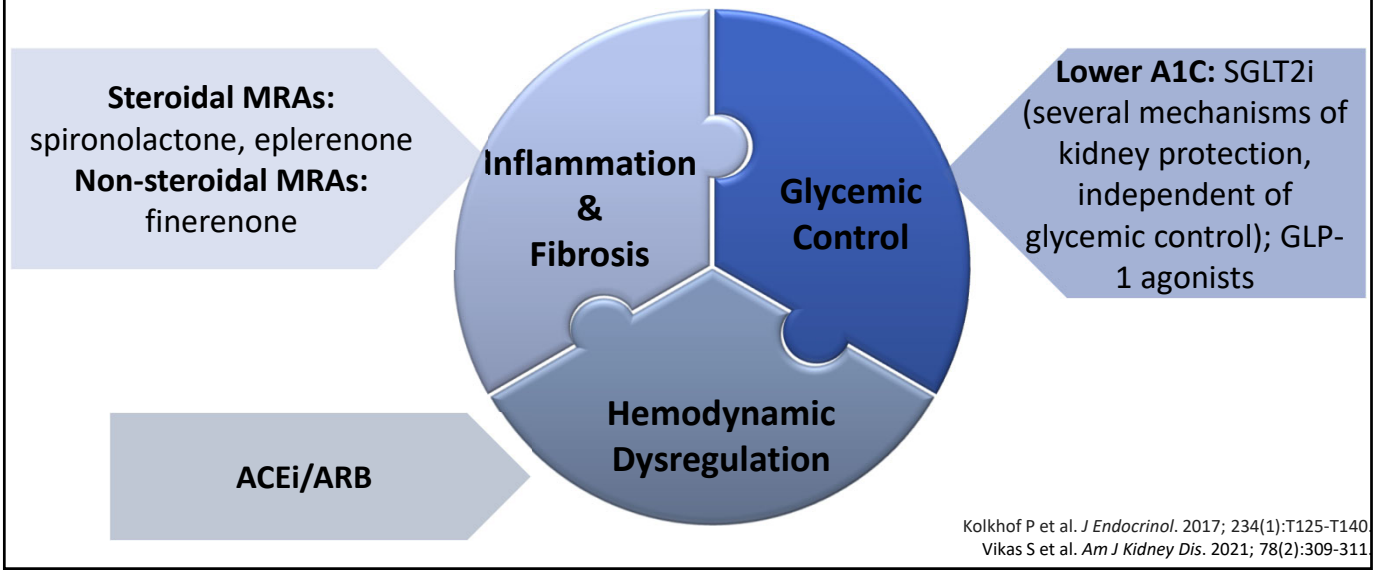
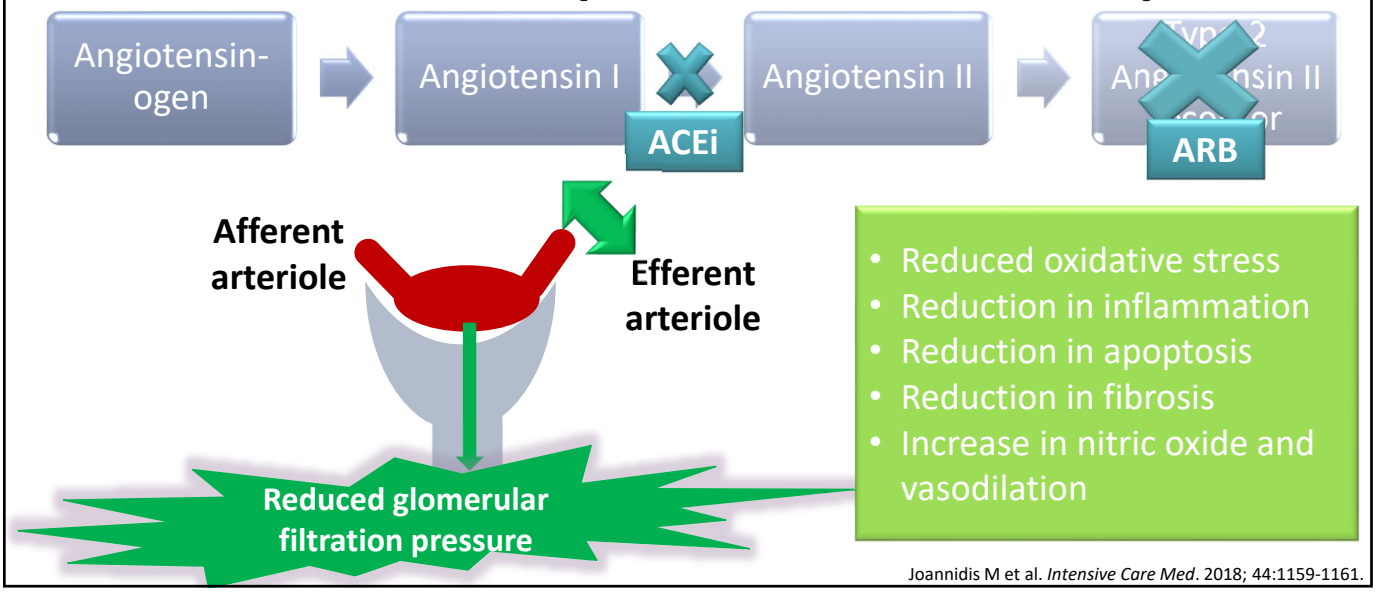
Piecing Together the Puzzle – Strategies to Slow CKD Progression



Kolkhof P et al. *J Endocrinol*. 2017; 234(1):T125-T140.
Vikas S et al. *Am J Kidney Dis*. 2021; 78(2):309-311.

The Well-Known Kidney Protective Mechanism of ACEi/ARB (The RAAS Blockade)



Joannidis M et al. *Intensive Care Med*. 2018; 44:1159-1161.

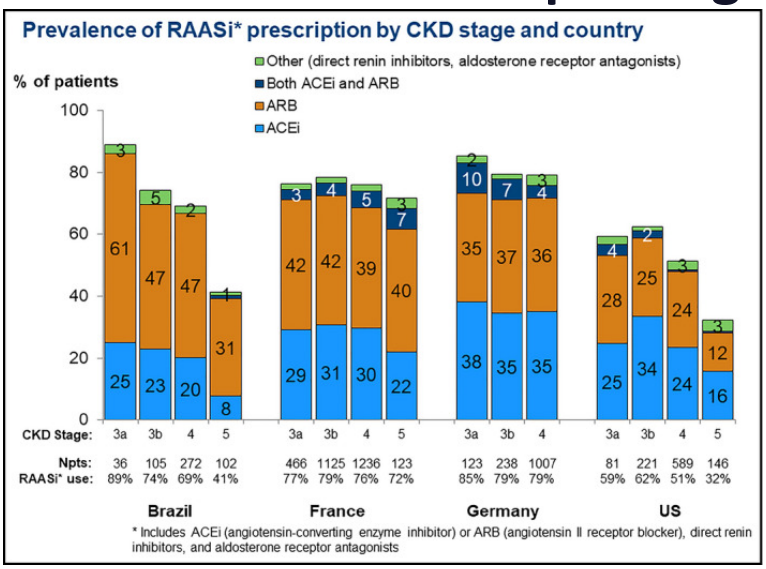
ACEi/ARB – Kidney Protective Evidence

Primary Outcomes: Doubling of baseline Scr, ESRD, death from any cause

Trial	Intervention	Primary Outcome	Effect
RENAAL (Losartan)	Losartan vs placebo	Doubling of SCr, ESRD, or death	16% RR reduction; P =0.02
IDNT (Irbesartan)	Irbesartan vs amlodipine & placebo	Same composite	20% RR reduction; P = 0.02

Brenner BM et al. *N Engl J Med*. 2001; 345(12):861-869.
Lewis EJ et al. *N Engl J Med*. 2001; 345(12):851-860.

Prescription of RAASi & its Determinants in Patients with Advanced CKD Under Nephrologist Care



Pecoits-Filho R et al. *J Clin Hypertens (Greenwich)*. 2019; 21(7):991-1001. Open access CC BY license (https://creativecommons.org/licenses/by/4.0/)

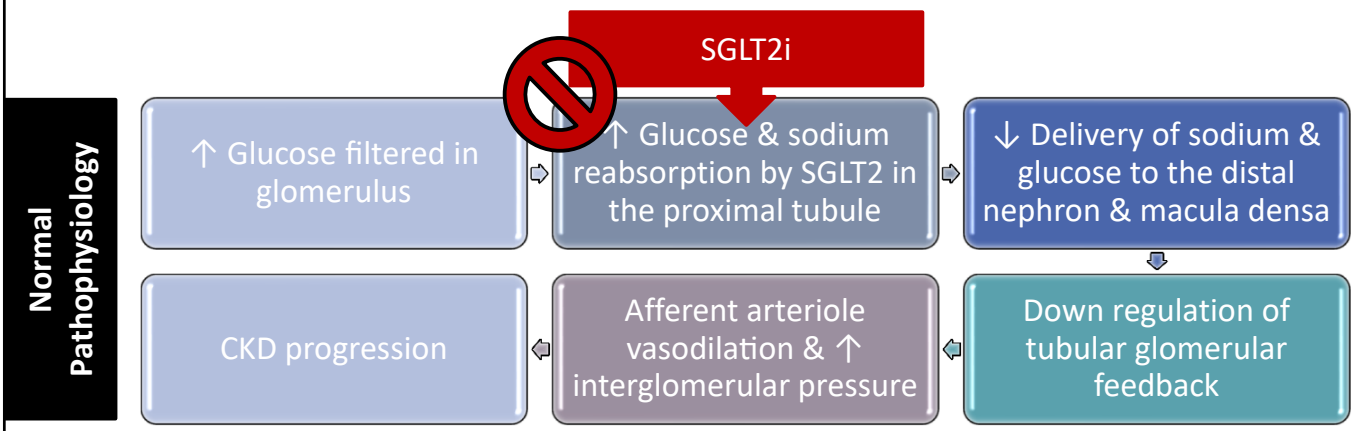
SGLT2i in Kidney Clinical Guidelines

- eGFR ≥20 with Urine ACR ≥200 mg/g (1A) or eGFR 20-45 mL/min/1.73 m^2 with ACR <200 mg/g (2B), independent of T2D
- T2D in eGFR ≥20 mL/min/1.73 m^2 to reduce CKD progression and CV events*
- HF, irrespective of level of albuminuria

*SGLT2i have not been adequately studied in kidney transplant recipients to recommend their use in this population.

Kidney Int. 2024; 105(4S): S117-S314.

SGLT2 Inhibitors – Mechanism in CKD?



Braunwald E. *Eur Heart J*. 2021; 43(11):1029-1030.
Margonato D et al. *Heart Fail Rev*. 2021; 26:337-345.
Heerspink HJ et al. *Circulation*. 2016; 134(10):752-772.

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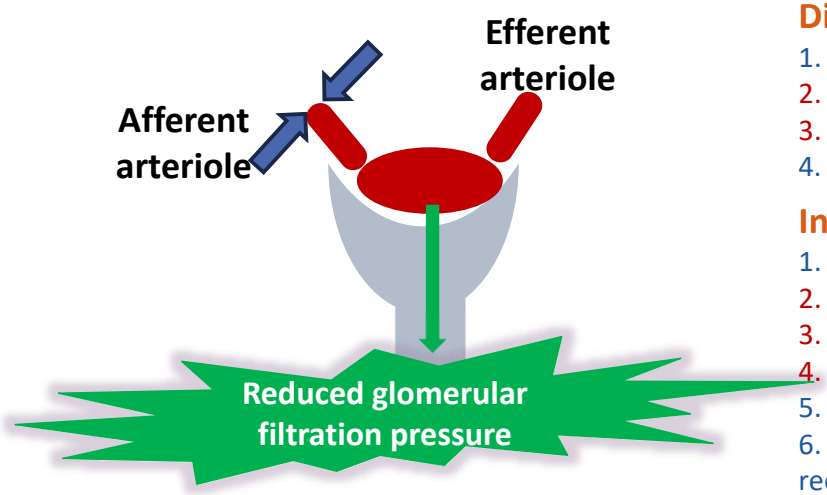


Direct Kidney Effects

1. Osmotic diuresis → ↓ interstitial pressure
2. ↓ Oxygen consumption
3. ↓ Oxidative stress and inflammation
4. ↓ Intraglomerular HTN

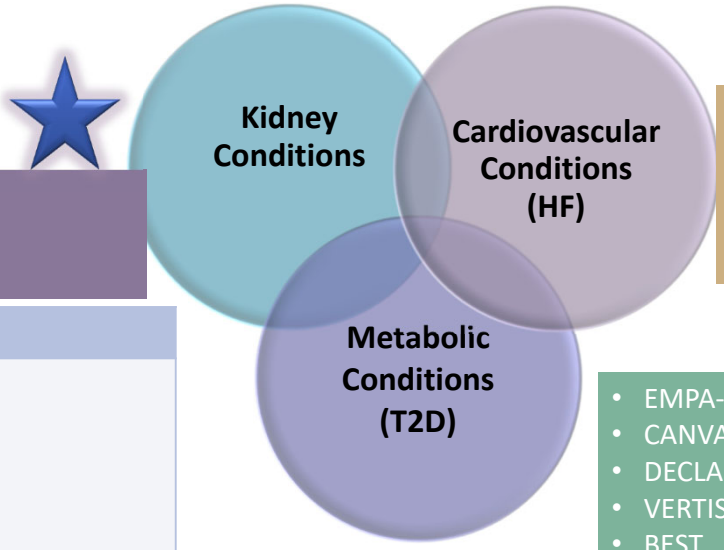
Indirect Kidney Effects

1. ↓ BP
2. ↓ Body fat and body weight
3. ↓ Oxidative stress and inflammation
4. ↑ Uricosuria
5. ↓ Plasma volume
6. Activation of angiotensin II type 2 receptor
7. Sympathetic modulation

Mostly due to glycosuria Mostly due to natriuresis

Braunwald E. *Eur Heart J*. 2021; 43(11):1029-1030.
Margonato D et al. *Heart Fail Rev*. 2021; 26:337-345.
Heerspink HJ et al. *Circulation*. 2016; 134(10):752-772.

SGLT2 Inhibitors Landmark Trials



- CREDENCE
- DAPA-CKD
- EMPA-Kidney

- DAPA-HF
- EMPEROR-Reduced
- SOLOIST
- EMPEROR-Preserved
- DELIVER

- EMPA-REG Outcome
- CANVAS
- DECLARE-IMI 58
- VERTIS-CV
- BEST

Agents in Class

- Bexagliflozin
- Canagliflozin
- Dapagliflozin
- Empagliflozin
- Ertugliflozin
- Sotagliflozin

SGLT2i – CV Outcomes

Trial	EMPA-REG (n = 7,020)	CANVAS (n = 10,142)	DECLARE-TIMI 58 (n = 17,160)	VERTIS-CV (n = 8,246)	SCORED (n=10,584)
Treatment	Empagliflozin vs. Placebo	Canagliflozin vs. Placebo	Dapagliflozin vs. Placebo	Ertugliflozin vs. Placebo	Sotagliflozin vs. Placebo
Key Inclusion Criteria	▪ T2D ▪ eGFR ≥ 30 mL/min/1.73m^2 ▪ Established CVD	▪ T2D ▪ eGFR ≥ 30 mL/min/1.73m^2 ▪ Established CVD or ≥ 2 CV risk factors	▪ T2D ▪ eGFR ≥ 60 mL/min/1.73m^2 ▪ Established CVD or risk factors for ASCVD	▪ T2D ▪ eGFR ≥ 30 mL/min/1.73m^2 ▪ Established CVD	▪ T2D ▪ eGFR 25-60 mL/min/1.73m^2 ▪ Established CVD or risk factors for ASCVD
Established CVD (%)	99	66	41	99	48.6
eGFR mL/min/1.73 m^2	48.6±7.8	76.7±20.3	85.4±15.8	76.1±20.9	44.4 (37-51.3)
UACR ≥300 mg/g (%)	769 (11)	760 (7.6)	1169 (6.8)	755 (9.2)	1658 (31.3)
Median Follow-Up (yr)	3.1	2.4	4.2	3	1.3
HR (95% CI)	MACE **0.86 (0.74-0.99)** HF hospitalization **0.65 (0.5-0.85)**	MACE **0.86 (0.75-0.97)** HF hospitalization **0.67 (0.52-0.87)**	MACE 0.93 (0.84-1.03) CV death or HF hospitalization **0.83 (0.73-0.95)**	MACE 0.97 (0.85-1.11)	Total no. of deaths from CV causes, hospitalizations for HF, and urgent visits for HF **0.74 (0.63-0.88)**

Wiviott SD et al. *N Engl J Med*. 2019; 380(4):347-357. Bhatt DL et al. *N Engl J Med*. 2021; 384(2):129-139.

Zinman B et al. *N Engl J Med*. 2015; 373(22):2117-2128. Bhatt D et al. *N Engl J Med*. 2021; 384:129-139.

McGuire DK et al. *JAMA Cardiol*. 2021; 6(2):148-158. Neal B et al. *N Engl J Med*. 2017; 377(7):644-657.

SGLT2i – HF Outcomes

	HFrEF			HFpEF	
Trial	DAPA-HF (n = 4,744)	EMPEROR-reduced (n = 3,730)	SOLOIST-WHF (n = 1,222)	EMPEROR-Preserved (n = 5,988)	DELIVER (n = 6,263)
Treatment	Dapagliflozin vs. Placebo	Empagliflozin vs. Placebo	Sotagliflozin vs. Placebo	Empagliflozin vs. Placebo	Dapagliflozin vs. Placebo
Key Inclusion Criteria	▪ LV ≤ 40% ▪ Elevated ▪ NYHA class II-IV ▪ eGFR ≥ 30 mL/min/1.73 m^2 ▪ SBP ≥ 95 mm Hg	▪ LV ≤ 40% and evidence of structural heart disease ▪ Elevated ▪ NYHA class II-IV ▪ Ambulatory or hospitalized ▪ eGFR ≥ 20 mL/min/1.73m^2 ▪ SBP ≥ 100 mm Hg	▪ T2DM ▪ Admitted for worsening HF ▪ Previous treatment with a loop diuretic for >30 days ▪ Previous diagnosis of HF (>3 months) ▪ Elevated NT-proBNP ▪ eGFR ≥ 30 mL/min/1.73m^2	▪ LVEF >40% ▪ Structural heart disease or history of HF admission within 12 months ▪ Elevated NT-proBNP ▪ NYHA functional class II–IV ▪ eGFR ≥ 20 mL/min/1.73m^2 ▪ SBP ≥ 100 mm Hg	▪ LVEF >40% and evidence of structural heart disease ▪ Elevated NT-proBNP ▪ NYHA functional class II–IV ▪ Ambulatory or hospitalized patients ▪ eGFR ≥ 25 mL/min/1.73m^2 ▪ SBP ≥ 95 mm Hg
Median f/u (yr)	1.5	1.3	0.76	2.2	0.75
Primary Outcome					
HR (95% CI)	CV death or worsening HF **0.74 (0.65-0.85)**	CV death or HF hospitalization **0.75 (0.65-0.86)**	CV death and HF hospitalizations and HF urgent visits **0.67 (0.52-0.85)**	CV death or HF hospitalization **0.79 (0.69-0.90)**	Time to first: CV death or HF hospitalization or urgent HF visit **0.82 (0.73-0.92)**

McMurray JJV et al. *N Engl J Med*. 2019; 381(21):1995-2008. Solomon SD et al. *N Engl J Med*. 2022; 387(12):1089-1098.

Packer M et al. *N Engl J Med*. 2020; 383(15):1413-1424. Bhatt DL et al. *N Engl J Med*. 2021; 384(2):117-128. Anker SD et al. *N Engl J Med*. 2021; 385(16):1451-1461.

SGLT2i – Kidney Outcomes

Trial	CREDENCE (n = 4,401)	DAPA-CKD (n = 4,304)	EMPA-KIDNEY (n = 6,609)
Treatment	Canagliflozin vs. Placebo	Dapagliflozin vs. Placebo	Empagliflozin vs. Placebo
Key Inclusion Criteria	▪ T2D ▪ eGFR 30 to <90 mL/min/1.73m^2 ▪ UACR >300 to 5000 mg/g ▪ Treated with max tolerated ACEi/ARB for ≥4 weeks prior to randomization	▪ eGFR 25 to 75 mL/min/1.73m^2 ▪ UACR 200 to 5000 mg/g ▪ Treated with max tolerated ACEi/ARB for ≥4 weeks prior to randomization	▪ eGFR 20 to <45 mL/min/1.73m^2 regardless of albuminuria, OR ▪ eGFR 45 to <90 mL/min/1.73m^2 with UACR ≥200 mg/g ▪ Treated with max tolerated ACEi/ARB unless deemed inappropriate by the investigator
Baseline T2D (%)	100	67	46
Median Follow-Up (yr)	2.6	2.4	2.0
HR (95% CI)	ESKD, doubling of SCr, or kidney or CV death **0.70 (0.59-0.82)**	≥50% decline in eGFR, ESKD, or kidney or CV death **0.61 (0.51-0.72)**	ESKD, ≥40% decline in eGFR, sustained eGFR of <10 mL/min/1.73m^2, or kidney or CV death **0.72 (0.64-0.82)**

Perkovic V et al. *N Engl J Med*. 2019; 380(24):2295-2306.
Heerspink HJL et al. *N Engl J Med*. 2020; 383(15):1436-1446.
The EMPA-KIDNEY Collaborative Group. et al. *N Engl J Med*. 2023; 388(2):117-127.
Mavrakanas TA et al. *Sci Rep*. 2023; 13(1):15922.
McGuire DK et al. *JAMA Cardiol*. 2021; 6(2):148-158.

Risk Mitigation for Side Effects of SGLT2i

Adverse Events	Potential Mitigating Strategies
Genital mycotic infections	• Daily hygiene to keep genital area clean and dry
Volume depletion	• Diuretic dose reduction in patients at risk for hypovolemia • Withold SGLT2 inhibitors during acute illness (nausea, vomiting, diarrhea) • Implement sick day protocol
DKA	• Educate patients on early recognition • "STOP DKA" protocol (stop SGLT2 inhibitor, test for ketones, maintain fluid and carbohydrate intake, insulin)
Need for Amputation	• Encourage foot self-examinations • Examinations by health care professionals at each visit
Hypoglycemia	• Dose adjustment of insulin and insulin secretagogues with maintenance of at least low dose insulin to avoid DKA

Navaneethan SD et al. *Am J Kidney Dis*. 2025; 85(2):135-176.

Diabetes Management in CKD – 2026 ADA Recommendations

- "To reduce kidney disease progression and cardiovascular risk in people with type 2 diabetes and CKD, a glucagon-like peptide 1 agonist with demonstrated benefit in this population is recommended." **A**

ADA standards of care, 2026. *Diabetes Care*. 2026; 49(Suppl 1).

GLP-1 Receptor Agonists in CKD

- **Direct Effects**
  - Reduce oxidative stress and inflammation
  - Reduce inflammation by decreasing cytokine production
  - Improve glomerular hemodynamic effects and reduced glomerular fibrosis
  - Increase natriuresis and diuresis
  - Increased sodium delivery to the macula densa
  - Reduction of albuminuria
- **Indirect Effects**
  - Glucose control
  - Weight loss
  - Blood pressure lowering

Salama L. *Am J Health-Syst Pharm*. 2025; 82(12):693-709.

Incretin Mimetics – CV Outcomes

Trial	ELIXA (n = 6068)	LEADER (n = 9,340)	EXSCEL (n = 14,752)	Harmony (n = 9,463)	REWIND (n = 9,903)
Treatment	Lixisenatide (SC) vs. Placebo	Liraglutide (SC) vs. Placebo	Exenatide vs. Placebo	Albiglutide vs. Placebo	Dulaglutide vs. Placebo
Key Inclusion Criteria	▪ T2D ▪ ACS event in prior 180 days	▪ T2D ▪ Age ≥50 yr with CVD or ≥60 yr with at least one CV risk factor	▪ T2D ▪ 70% with CVD and 30% without CVD ▪ eGFR ≥ 30 mL/min/1.73m^2	▪ T2D ▪ Age ≥40 yr with ASCVD events ▪ eGFR ≥ 30 mL/min/1.73m^2	▪ T2D ▪ Age ≥50 yr with vascular disease, ≥55 at high risk of CVD or with CKD, or ≥60 with two CVD risk factors ▪ eGFR ≥ 15 mL/min/1.73m^2
Established CVD (%)	100	81	73	100	31
Median Follow-Up (yr)	2.1	3.8	3.2	1.6	5.4
Primary Outcome					
HR (95% CI)	4- pt. MACE 1.02 (0.89 to 1.17)	MACE **0.87 (0.78-0.97)**	MACE 0.91 (0.83-1.00)	MACE **0.78 (0.68 to 0.90)**	MACE **0.88 (0.79-0.99)**

Holman RR et al. *N Engl J Med*. 2017; 377(13):1228-1239.
Gerstein HC et al. *Lancet*. 2019; 394(10193):121-130.
Marx N et al. *Circulation*. 2022; 146(24):1882-1894.
Pfeffer MA. *N Engl J Med*. 2015; 373(23):2247-57.
Marso SP et al. *N Engl J Med*. 2016; 375(4):311-22.
Hernandez AF. *Lancet*. 2018; 392(10157):1519-1529.

Incretin Mimetic – Semaglutide CV Outcome

Trial	SUSTAIN 6 (n = 3,297)	PIONEER-6 (n=3,183)	SELECT (n = 17,604)	SOUL (n = 9,650)
Treatment	Semaglutide (SC) vs. Placebo	Semaglutide (oral) vs. Placebo	Semaglutide (SC) vs. Placebo	PO semaglutide vs. Placebo
Key Inclusion Criteria	▪ T2D ▪ Age ≥50 yr with CVD, HF or CKD or ≥60 yr with at least one CV risk factor	▪ T2D ▪ Age ≥ 50 yr with CVD or ≥60 yr with CV risk factors ▪ eGFR ≥ 30 mL/min/1.73m^2	▪ Age ≥45 yr , BMI ≥ 27 kg/m^2 and preexisting CV disease ▪ Excluded patients with DM	▪ T2D ▪ Preexisting CVD and/or CKD
Established CVD (%)	83	85	100	83.6
Median Follow-Up (yr)	2.1	1.3	3.3	4
Primary Outcome				
HR (95% CI)	MACE **0.74 (0.58-0.95)**	MACE 0.79 (0.57-1.11)	MACE **(0.80; 0.72–0.9)**	3 pt-MACE (time to first occurrence of composite of CV death, nonfatal MI, or nonfatal stroke) **0.86 (0.77-0.96)**

Marso SP et al. *N Engl J Med*. 2016; 375(19):1834-1844.
Marx N et al. *Circulation*. 2022; 146(24):1882-1894.
McGuire DK. *N Engl J Med*. 2025; 392(20):2001-2012.
Husain M et al. *N Engl J Med*. 2019; 381(9):841-851.
Lincoff MA et al. *N Engl J Med*. 2023; 389(24):2221-2232.

Incretin Mimetic (Semaglutide) – Kidney Outcomes

Trial	FLOW (n = 3,533)
Treatment	Semaglutide SC (titrated up to a maximum of 1 mg weekly) vs. Placebo
Key Inclusion Criteria	▪ T2D (A1c <10%), and ▪ eGFR of >50 to<75 mL/min/1.73 m^2 and UACR >300 to <5000 mg/g OR ▪ eGFR >25 to<50 mL/min/1.73 m^2 and UACR >100 to <5000 mg/g ▪ Receiving stable maximum dose ACEi or ARB
Median Follow-Up (yr)	3.4
Primary Outcome	
HR (95% CI)	Onset of kidney failure (persistent eGFR <15 mL/min/1.73 m^2 or initiation of chronic KRT); persistent >50% reduction in eGFR or death from kidney or CV cause **0.76 (0.66-0.88)**

Perkovic V et al. *N Engl J Med*. 2024; 391(2):109-121.

Incretin Mimetics – CV + Kidney Outcomes (Ongoing)

Trial	SURPASS-CVOT	TREASURE-CKD
Treatment	Tirzepatide SC vs dulaglutide SC	Tirzepatide SC vs placebo
Key Inclusion Criteria	▪ T2DM with confirmed ASCVD events, HbA1c ≥7.0% to ≤10.5%, BMI ≥25 kg/m^2	▪ All participants (with or without T2DM): BMI ≥27 kg/m^2 at screening, diagnosed with CKD, eGFR ≥25 to ≤60 mL/min/1.73 m^2 or eGFR ≥25 to ≤75 mL/min/1.73 m^2 if UACR >30 mg/g, receiving ACEi or ARB at maximum tolerable dose
Median Follow-Up (yr)	4 years	Ongoing trial; results pending
HR (95% CI)	MACE (HR 0.92; 95.3% CI 0.83-1.01; p=0.086) [Noninferior]	**TBD** Change from baseline in kidney oxygenation in participants with or without T2DM

A Study of Tirzepatide (LY3298176) (TREASURE-CKD). NCT05536804. https://clinicaltrials.gov/ct2/show/NCT05536804 (accessed 2025 Oct 31).
Nicholls SJ et al. *Am Heart J*. 2024; 267:1-11.

Incretin Mimetics – Common Adverse Events

GI-Related

- Nausea
- Vomiting
- Constipation
- Diarrhea
- Abdominal pain
- Dyspepsia

Others

- Injection site reactions
- Hypoglycemia
  - Low risk with monotherapy
  - Increased risk with insulin

Salama L. *Am J Health-Syst Pharm*. 2025; 82(12):693-709.

Incretin Mimetics – Safety Concerns

Contraindications

- Personal or family history of Medullary Thyroid Cancer (MTC) or patients with Multiple Endocrine Neoplasia Type 2 (MEN 2)
- Hypersensitivity

Precautions

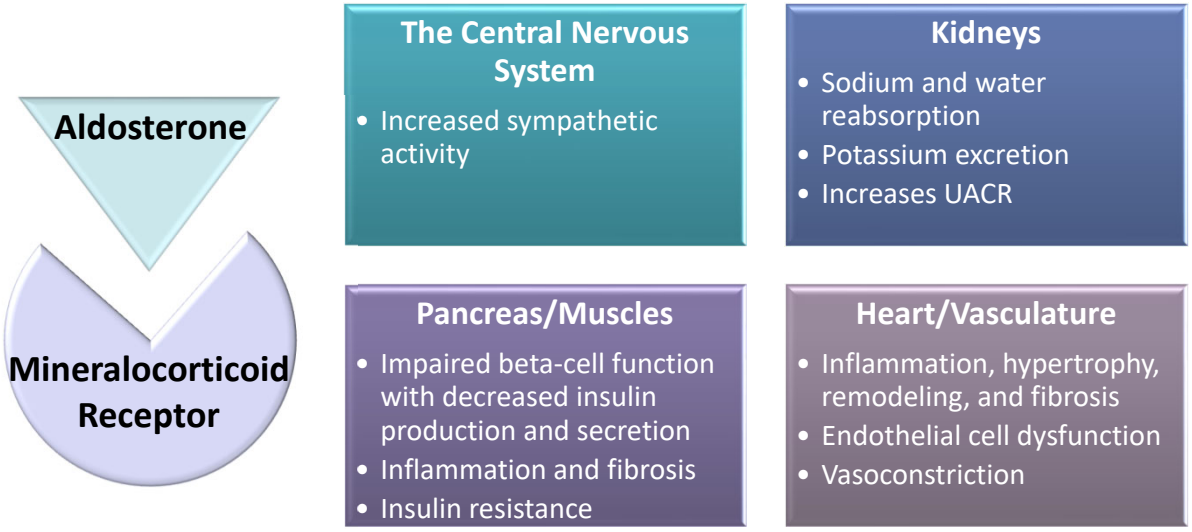
- Retinopathy complications
- Gallbladder disease
- Pancreatitis?

Emerging Concerns

- Sarcopenia
- Suicidal ideation
- Perioperative care
- Counterfeit products

Salama L. *Am J Health-Syst Pharm*. 2025; 82(12):693-709.

What Role Does Aldosterone Play in CKD?



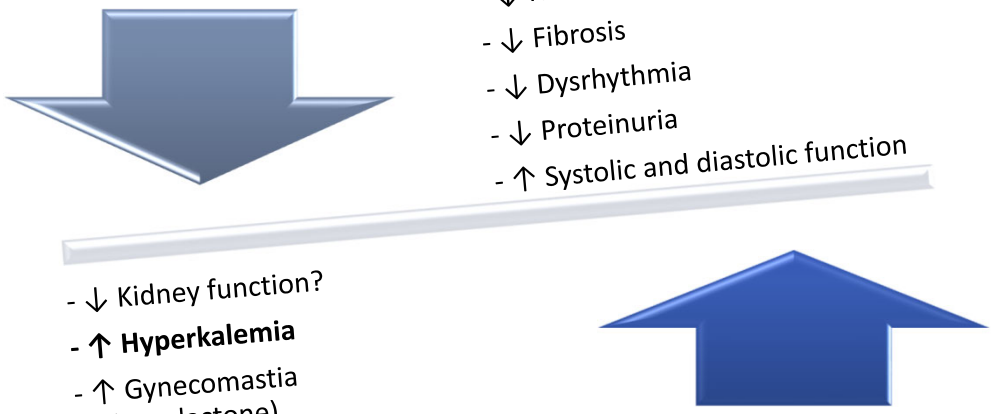
Carlos M et al. *Circ Res*. 2015; 116:206-213.

Aldosterone Antagonists in Addition to Renin Angiotensin System Antagonists for Preventing the Progression of CKD

- Cochrane Kidney and Transplant Register of Studies up to 13 January 2020
- 44 clinical trials; 5745 patients
- ACEi ± ARB + placebo vs. ACEi ± ARB + aldosterone antagonists (selective/non-selective or nonsteroidal)
  - Reduction in
    - Protein excretion (14 studies, n=1193) -0.51, 95% CI -0.82 to -0.20
    - eGFR (13 studies, n=1165) -3.00 mL/min/1.73 m^2, 95% CI -5.51 to -0.49
    - SBP (14 studies, n=911) -4.98 mm Hg, 95% CI -8.22 to -1.75
  - Hyperkalemia (17 studies, n=3001) RR 2.17, 95% CI 1.47 to 3.22

Chung EY et al. *Cochrane Database Syst Rev*. 2020; 10(10):CD007004.

Can We Block the Mineralocorticoid Receptors without Causing Hyperkalemia?



Naegele M. *Eur Heart J*. 2016; 37(27):2115-2117.

Key Differences Between Steroidal and Nonsteroidal MRAs

	Spironolactone	Eplerenone	Finerenone
Selectivity	Unselective	Medium	High
Potency	High	Low	High
Tissue Distribution	Kidney >> heart (>6 fold)	Kidney > heart (~3 fold)	Balanced kidney: heart
Metabolites	Prodrug with active metabolites	No active metabolites	
Metabolite List	• 7α-thiomethylspironolactone • **Canrenone** • 6β-hydroxy-7α-thiomethylspironolactone	NA	
Half-life	• Short: ~1.4 hr • Metabolites: ~12-24 hr	Long (~3-6 hr)	Short (~2-3 hr)
Plasma Protein Binding	High (>90%)	Low (~50%)	High (~90%)

Floege J. *Kidney Int*. 2021; 99(2):292-294.
Kolkhof P et al. *Handb Exp Pharmacol*. 2017; 243:271-305.
Rajiv A et al. *Eur Heart J*. 2021; 42(2):152-161.

Finerenone: CV, Kidney & HF Outcomes

Trial	FIDELIO-DKD (n = 5,734)	FIGARO-DKD (n = 7,437)	FINEARTS-HF (n = 6,001)
Treatment	Finerenone vs. Placebo	Finerenone vs. Placebo	Finerenone vs. Placebo
Key Inclusion Criteria	▪ T2D ▪ eGFR 25 to <60 mL/min/1.73m^2 and UACR 30 to <300 mg/g, or ▪ eGFR 25 to <75 mL/min/1.73m^2 and UACR 300 to 5000 mg/g ▪ Treated with maximum tolerated ACEi/ARB	▪ T2D ▪ eGFR 25 to 90 mL/min/1.73m^2 and UACR 30 to <300 mg/g, or ▪ eGFR >60 mL/min/1.73m^2 and UACR 300 to 5000 mg/g ▪ Treated with maximum tolerated ACEi/ARB	▪ Age ≥40 ▪ Symptomatic HF ▪ HF and LV ≥ 40% ▪ Evidence of structural heart disease ▪ Elevated levels of natriuretic peptides
Median Follow-Up	2.6 years	3.4 years	32 months
Primary Outcome			
HR (95% CI)	Kidney failure, ≥40% decline in eGFR, or kidney death **0.82 (0.73-0.93)**	CV death, non-fatal MI, non-fatal stroke, or hospitalization for HF **0.87 (0.76-0.98)**	Composite of total worsening HF events (event defined as a first or recurrent unplanned hospitalization or urgent visit for HF) and death from CV causes. **0.84 (0.74 to 0.95)**

Pitt B et al. *N Engl J Med*. 2021; 385(24):2252-2263.
Filippatos G et al. *Circulation*. 2022; 145(6):437-447.
Solomon SD et al. *N Engl J Med*. 2024; 391:1475-1485.

ADA/KDIGO Recommendation on MRAs

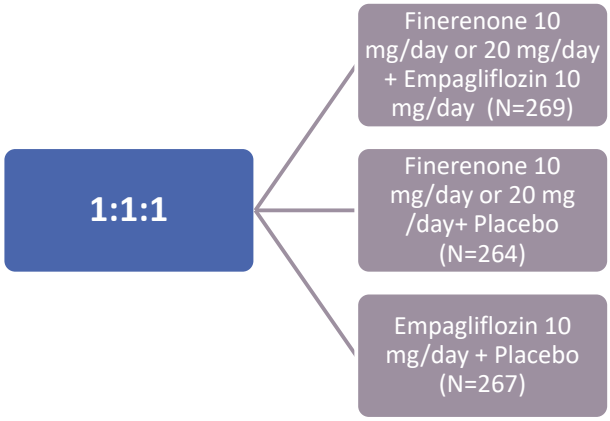
- To reduce CKD progression and cardiovascular events in people with CKD and albuminuria, a nonsteroidal MRA that has been shown to be effective in clinical trials is recommended (if eGFR is ≥25 mL/min/1.73 m^2). Potassium levels should be monitored 1 month after initiation.

De Boer IH et al. *Kidney Int*. 2022; 102(5):974-989.
ADA standards of care, 2026. *Diabetes Care*. 2026; 49(Suppl 1).

Finerenone and empagliflozin: Is the combination better than either agent alone in CKD and T2D? CONFIDENCE Trial

- **Methods**
  - Randomized, double-blind, active-controlled, multinational trial
  - T2D + CKD stages 2-3
  - UACR ≥300 mg/g to <5000 mg/g
  - 14 countries
  - 98% ACEi/ARB users
  - 23% GLP-1 RA users
  - Stratified according to eGFR and UACR

- **Randomization**



Agarwal R. *N Engl J Med*. 2025; 393(6):533-543.

Finerenone and empagliflozin: Is the combination better than either agent alone in CKD and Type 2 Diabetes? CONFIDENCE Trial

- Primary outcome
  - Relative change in the log-transformed mean UACR from baseline to 180 days in
    - Dual therapy vs. finerenone
    - Dual therapy vs. empagliflozin

Results

Empagliflozin:
- 29% ↓ UACR at day 180
- Hyperkalemia: 3.8%
- ≥30% eGFR drop: 1.1%

Finerenone:
- 32% ↓ UACR at day 180
- Hyperkalemia: 11.4%
- ≥30% eGFR drop: 3.8%

Empagliflozin + Finerenone:
- 52% ↓ UACR at day 180
- Hyperkalemia: 9.3%
- ≥30% eGFR drop: 6.3%

Among persons with both chronic kidney disease and type 2 diabetes, initial therapy with finerenone plus empagliflozin led to a greater reduction in the urinary albumin-to-creatinine ratio than either treatment alone.

Agarwal R. *N Engl J Med*. 2025; 393(6):533-543.

2026 ADA Recommendation

- Simultaneous initiation of an SGLT2 inhibitor and a nonsteroidal MRA (finerenone) can be considered in adults with type 2 diabetes and UACR ≥100 mg/g with eGFR 30–90 mL/min/1.73 m^2 on a renin- angiotensin system inhibitor due to evidence of safety and beneficial effects on albuminuria. **B**

ADA standards of care, 2026. *Diabetes Care*. 2026; 49(Suppl 1).

Aldosterone Synthase Inhibitors (ASIs)

- Mechanism:
  - Directly inhibit CYP11B2 (aldosterone synthase)
    - The enzyme responsible for the final steps of aldosterone synthesis in the adrenal cortex
    - ↓ aldosterone → ↓ sodium retention, ↓ blood pressure, ↓ cardio-kidney injury
- Target aldosterone excess implicated in hypertension, CKD, and cardiovascular disease
- Current status:
  - No FDA-approved ASI for hypertension or cardio-kidney disease
  - Agents under investigation: lorundrostat, baxdrostat, dexfadrostat, vicadrostat, JX09
  - Osilodrostat → approved for Cushing's syndrome (non-selective; cortisol suppression risk)
  - Lorundrostat (Phase 3): significant BP reduction with favorable safety; monitor for hyperkalemia

Fioretti F. *J Am Coll Cardiol*. 2025; 86(5):354-373.

Aldosterone Synthase Inhibitors in Resistant Hypertension: Phase 3 Evidence

	Lorundrostat (Launch-HTN, *JAMA* 2025)	Baxdrostat (BaxHTN, 2025)
Population	1083 adults on 2–5 antihypertensives	796 adults with uncontrolled/resistant HTN
Oral Dosage	50 mg daily	1 mg & 2 mg daily
SBP Reduction (vs. placebo)	−16.9 vs. −7.9 mm Hg → −9.1 mm Hg (P<0.001)	−14.5 & −15.7 vs. −5.8 mm Hg → −8.7 & −9.8 mm Hg (P<0.001)
Safety	Mild/moderate AEs; hyperkalemia 0.4-0.6%; no glucocorticoid deficiency	Hyperkalemia 2.3-3.0%; minimal cortisol impact

Saxena M. *JAMA*. 2025; 334(5):409-418.
Flack JM. *N Engl J Med*. 2025; 393(14):1363-1374.

Vicadrostat - EASi-KIDNEY Trial

Treatment	Vicadrostat 10 mg PO Vs Placebo
Key Inclusion Criteria	eGFR >20 and <45 or ≥45 and <90 + uACR ≥200 mg/g
Key Exclusion Criteria	K+ > 5.2 mmol/L
Background Therapy	Empagliflozin and clinically appropriate RAS inhibitor
Composite Primary Outcome	Kidney disease progression (Maintenance dialysis or kidney transplant, death from kidney failure, sustained eGFR <10 or ≥40% eGFR decline) or CV death or HF hospitalization
Results	Pending

Judge PK et al. *Nephrol Dial Transplant*. 2025; 40(6):1175-1186.

Summary – Agents That Slow CKD Progression

Agent	CKD Population	Primary CKD Mechanism	A1C Reduction	Weight Reduction	CV Benefit	Other Compelling Need
RASi (ACEi / ARB)	CKD with or without T2DM, especially albuminuria	↓ intraglomerular pressure, ↓ proteinuria	None	None	Yes	Foundation therapy especially in albuminuria
SGLT2 inhibitor	CKD with or without T2DM	Tubuloglomerular feedback, ↓ hyperfiltration	Mild	Mild	Yes	HF, HTN, ASCVD
Semaglutide (subQ)	CKD with or without T2DM, obesity	Metabolic, weight, and hemodynamic effects	High	High	Yes	Excess weight/ obesity, MASH (ESSENCE trial), hyperglycemia, ASCVD
Finerenone	CKD with T2DM only	Anti-inflammatory, anti-fibrotic	None	None	Yes	Residual albuminuria despite RASi ± SGLT2i

Learning Objectives

1. Apply guideline recommendations to identify and screen patients at risk of CKD using both uACR and eGFR to provide early identification, early access to treatment, and reduce the risk of kidney disease progression and adverse cardiovascular outcomes.
2. Analyze guideline-based recommendations and clinical evidence for current and emerging therapies to reduce the risk for CKD progression as well as cardiovascular risks.
3. **Prioritize opportunities within healthcare systems to bridge care and provide holistic, individualized care for people at risk for/with CKM syndrome.**

Missed Opportunities

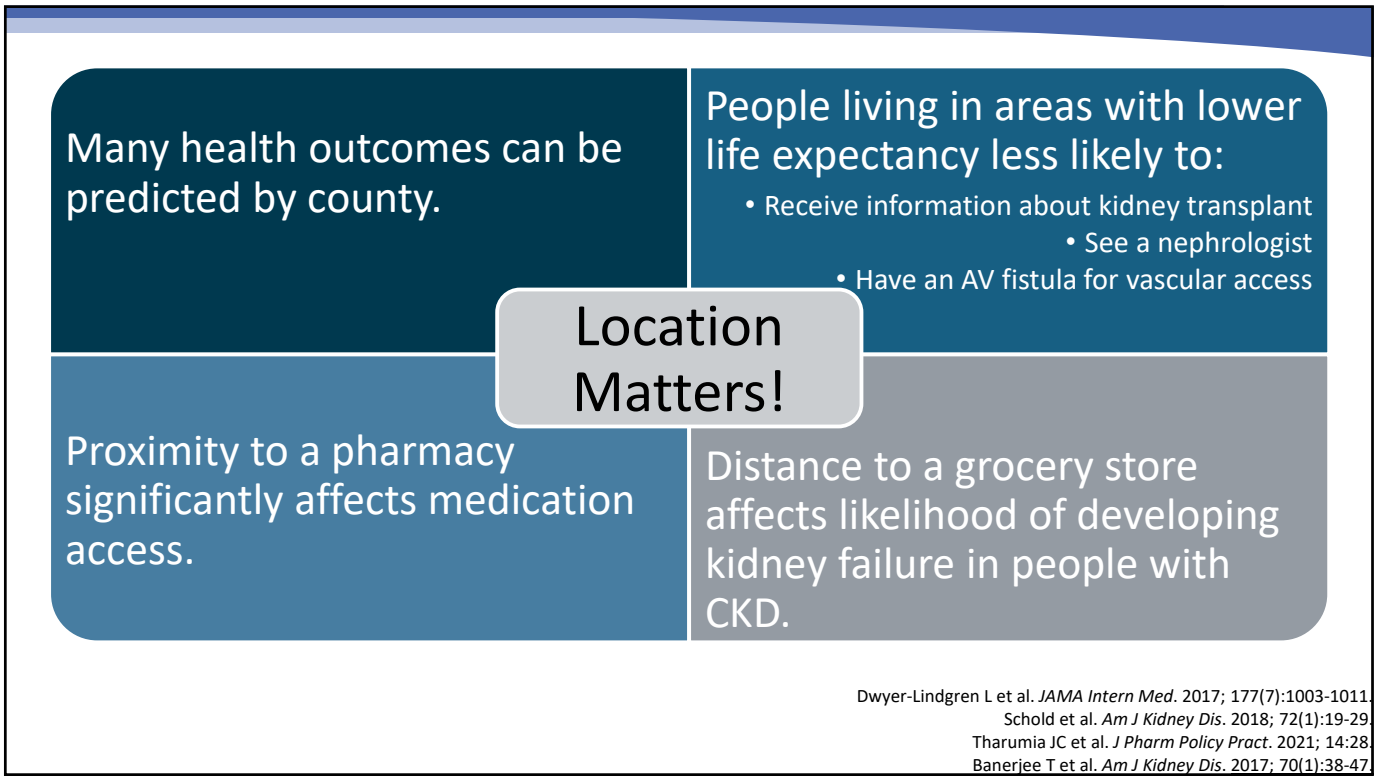
Care Gap	• Discrepancy between best practice and actual treatment
Disparities	• *"Preventable differences in the burden of disease, injury, violence, or opportunities."* • *Directly related to unequal distribution of social, political, economic, and environmental resources."* – CDC

Centers for Disease Control and Prevention. Health Disparities. November 29, 2024. https://www.cdc.gov/healthy-youth/health-disparities/?CDC_AAref_Val=https://www.cdc.gov/healthyyouth/disparities/index.htm (accessed 2025 Oct 25).

Pharmacotherapy Care Gaps in DKD

Recommendation	Implementation Rate	Implications
UACR testing	10-40%	Decreased diagnosis, prescribing, monitoring
ACEi/ARB	25-40%	CKD progression, kidney failure, CV risk
SGLT2i	13%	CKD progression, kidney failure, CV risk, mortality
GLP-1 RA	17%	CV risk

Adapted from Tuttle KR et al. *Clin J Am Soc Nephrol.* 2022; 17(7):1092-1103.



Dwyer-Lindgren L et al. *JAMA Intern Med*. 2017; 177(7):1003-1011.
Schold et al. *Am J Kidney Dis*. 2018; 72(1):19-29.
Tharumia JC et al. *J Pharm Policy Pract*. 2021; 14:28.
Banerjee T et al. *Am J Kidney Dis*. 2017; 70(1):38-47.

Disparities Exist in SGLT2i Use in T2D

- Use increased over 5-year study period (2015-2019)
- Racial, ethnic, gender, and socioeconomic inequities identified
- Black race, female, and lower socioeconomic status associated with lower rates of SGLT2i use

Eberly LA et al. *JAMA Netw Open*. 2021; 4(4):e216139.

Medication Care Gaps in CKD

- Study of 23 integrated primary care sites
- Jan 2021-Jan 2022
- N=7199 patients with DKD
  - Age 18+
  - T2D
  - UACR >30 mg/g
  - No kidney failure

Care Gaps Identified
- RAASi: 42%
- SGLT2i: 80.3%

Racial and Ethnic Disparities Identified
- SGLT2i: Black non-Hispanic and Hispanic patients more likely than Whites to experience care gap

Rikin S et al. *J Gen Intern Med*. 2023; 38(7):1599-1605.

American Heart Association Cardiovascular-Kidney Metabolic Health Initiative

- Launched in 2024
- Public Health Emergency
- Initiative to focus on care coordination
- De-fragmenting patient care to improve outcomes with patients' needs at center of treatment

AHA. Cardiovascular-Kidney-Metabolic Health Implementation Guide. 2025. https://www.heart.org/en/professional/cardiovascular-kidney-metabolic-health/Implementation (accessed 2025 Oct 25).

Interdisciplinary Care Team

- CKM coordinator
- Primary care
- Cardiology
- Nephrology
- Endocrinology
- Pharmacy
- Nursing
- Care navigators
- Social workers
- Community health workers

AHA. Cardiovascular-Kidney-Metabolic Health Implementation Guide. 2025. https://www.heart.org/en/professional/cardiovascular-kidney-metabolic-health/Implementation (accessed 2025 Oct 25).

Social Determinants of Health

Healthy People 2030, U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. https://health.gov/healthypeople/objectives-and-data/social-determinants-health (accessed 2025 Oct 28).

CKM Resources

- American Heart Association CKM Health Resources
- PREVENT Calculator
  - Online Calculator
  - Open-source code
- CKM Implementation Guide
- Patient Handouts
- CKM Center Certification
- Local Resources

AHA. Cardiovascular-Kidney-Metabolic Health Implementation Guide. 2025. https://www.heart.org/en/professional/cardiovascular-kidney-metabolic-health/Implementation (accessed 2025 Nov 3).

Pharmacists' Roles in CKD

KDIGO stresses the use of **multidisciplinary teams** and highlights **medication stewardship.**

- Perform comprehensive medication reviews periodically and at transitions of care
- Medication Discontinuation and Restart
  - Medications may be held during acute illness
  - Planned discontinuation of medications (e.g., metformin, ACEi, ARB, SGLT2i) 48-72 hours before elective surgery or for adverse effects
  - **Establish plan to restart medications**
    - Communicate to healthcare team, patient, caregiver
    - Document in chart
- Counsel patients on
  - Benefits and risks of medications
  - Possible side effects
  - Importance of lab monitoring

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Perspective

Kidney Medicine

Pharmacy Practice Standards for Outpatient Nephrology Settings

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Patients with kidney disease represent a medically complex group of patients with high medication burdens that could benefit from clinical pharmacy services as part of the interdisciplinary care team to optimize medication use. The "Advancing American Kidney Health" executive order includes new value-based reimbursement models to be tested by the Center for Medicare and Medicaid Innovation beginning January 2021 and January 2022. Advancing American Kidney Health executive order poses opportunities for the inclusion of comprehensive medication management. Following an iterative process integrating input from a diverse expert panel, published standards, clinical practice guidelines, peer review, and stakeholder feedback, our group developed practice standards for pharmacists caring for patients with kidney disease in health care settings. The standards focus on activities that are part of direct patient care and also include activities related to public health and advocacy, population health, leadership and management, and teaching, education and dissemination of knowledge. These standards are intended to be used by a variety of professionals, from pharmacists starting new practices to practice managers looking to add a pharmacist to the clinical team, to create standardization in services provided.

Complete author and article information provided before references.

Kidney Med. 4(8):100509. Published online June 26, 2022.

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Cardone KE et al. *Kidney Med*. 2022; 4(8):100509.

Collect

- Medication history
- Immunization status
- Kidney function
- Social determinants of health
- Subjective and objective information
  - HTN
  - Diabetes
  - Lipids
  - CKD
  - AKI
  - Drug-induced kidney disease
  - Anemia
  - Electrolytes
  - Acid/base balance
  - CKD mineral and bone disease
  - Glomerulonephritis

Cardone KE et al. *Kidney Med.* 2022; 4(8):100509.
Joint Commission of Pharmacy Practitioners (JCPP). Pharmacists' Patient Care Process. https://jcpp.net/resourcecat/patient-care-process/ (accessed 2025 Oct 27).

Assess

- Comprehensive medication review
- Consider:
  - Medications to slow CKD progression
  - Dose adjustment based on kidney function
  - Avoid nephrotoxins
  - Polypharmacy
  - Adherence aids
  - Cost, access, education needs
  - Management of complications of CKD
  - Pretransplant evaluation
  - Drug interactions
  - Adverse events

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JCPP. Pharmacists' Patient Care Process. https://jcpp.net/resourcecat/patient-care-process/ (accessed 2025 Oct 27).

Plan

- Comprehensive
- Shared decision-making
  - Patient / care partner
  - Interprofessional team
- Consider goals of care
  - (Transplant vs. KRT vs. palliative care)

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JCPP. Pharmacists' Patient Care Process. https://jcpp.net/resourcecat/patient-care-process/ (accessed 2025 Oct 27).

Implement

- Communicate the plan
- Seek input from team
- Discuss with patient
- Provide a copy of the medication list
- Ensure access to the medication
- Document

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JCPP. Pharmacists' Patient Care Process. https://jcpp.net/resourcecat/patient-care-process/ (accessed 2025 Oct 27).

Follow-Up

- Routinely collect f/u information
- Update patient data and assessments
- Revise the plan as needed

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JCPP. Pharmacists' Patient Care Process. https://jcpp.net/resourcecat/patient-care-process/ (accessed 2025 Oct 27).

Public Health and Advocacy

- Prepared to lead or participate in
  - Kidney educational initiatives
  - Immunization campaigns
  - Screenings
  - Advocacy

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Population Health

- Protocol development, revision, and implementation
- Medication use evaluations to ensure clinical and quality population metrics are met
- Promote equity

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Leadership and Management

- Ensure proper supervision of the pharmacy team
- Ensure services are efficient, effective, and well-integrated in the interprofessional team

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Teaching, Education, and Dissemination of Knowledge

- Professionals who play a key role in educating on kidney disease and medication management
  - Administrators
  - Payors
  - Nephrologists
  - Advanced practitioners
  - Pharmacists
  - Nurses
  - Dietitians
  - Social workers
  - Other healthcare providers
  - Patients

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Key Takeaways

- Incorporate CKD screening using 2 tests: eGFR and uACR.
- Integrate the PREVENT calculator into the CV risk assessment.
- Optimize medications for CKM health:
  - RAASi and SGLT2i are foundational for CKD management;
  - ns-MRA and GLP-1 RA are recommended for high-risk patients with persistent albuminuria or T2D;
  - Investigational agents hold promise for further risk reduction, pending availability of favorable outcome data and regulatory approval
- Explore integrating a CKM coordinator within your healthcare team.

How will you change your practice?

- Educate team members on guideline-based recommendations and clinical evidence for current and emerging therapies to reduce the risk for CKD progression as well as cardiovascular risks.
- Incorporate current evidence-based recommendations to identify and screen patients at risk of CKD.
- Collaborate with the interprofessional team to bridge care and provide holistic, individualized care for people at risk for/with CKM syndrome.

Take a moment to reflect on changes you would make based on what you learned today

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