ABCDE to identify and prevent chronic kidney disease: a call to action

NEPHROLOGY DIALYSIS TRANSPLANTATION

INTRODUCTION

- CKD affects over 850 million people globally.
- Prevalence continues rising due to diabetes and aging.
- CKD causes major health, social, and economic burdens.
- It reduces both lifespan and quality of life.
- Often progresses silently until advanced irreversible stages.

Role of the European Renal Association (ERA)

- ERA created the Strong Kidneys Task Force initiative.
- Purpose: raise awareness about kidney health and disease.
- Task Force emphasizes CKD’s impact on public well-being.
- Focus on education for patients, clinicians, and caregivers.
- Collaboration includes EKHA and European Kidney Patients Federation

Launch of the ABCDE Campaign

- First major initiative of the Strong Kidneys Task Force.
- ABCDE campaign promotes proactive kidney health awareness.
- Encourages individuals to ask key kidney health questions.
- Uses social media to reach diverse global audiences.
- Aims to make CKD prevention “as easy as ABCDE.

Definition of CKD

Core Definition:

- CKD is an abnormality of kidney structure or function.
- Must persist for at least three continuous months.
- Even early abnormalities can have major health effects.
- The condition includes both structural and functional disorders.

Definition of CKD

Diagnostic Criteria

- Diagnosis requires one of two main findings:
  - Persistent **markers of kidney damage**, or
  - **Decreased GFR** below 60 mL/min/1.73 m².
- Abnormalities must be confirmed for at least 3 months.
- Short-term changes suggest acute injury, not chronic disease.

Table 1: Criteria required for diagnosis of CKD (either of the following must be present for at least 3 months).

Markers of kidney damage (one or more)	Albuminuria (UACR ≥30 mg/g) OR Urine sediment abnormalities OR Persistent haematuria OR Electrolyte and other abnormalities due to tubular disorders OR Abnormalities detected by histology OR Structural abnormalities detected by imaging OR History of kidney transplantation OR
Decreased GFR	GFR <60 ml/min/1.73 m^2 (GFR categories G3a–G5)

Adapted from Kidney Disease: Improving Global Outcomes CKD Work Group. KDIGO 2024 clinical practice guideline for the evaluation and management of chronic kidney disease. Kidney Int 2024;105(4S):S117–314.

Definition of CKD

Classification System (CGA)

- CKD is classified by **Cause**, **GFR**, and **Albuminuria**.
- Abbreviation **CGA** used in international guidelines.
- This system standardizes diagnosis and guides management.

Table 2: GFR and albuminuria categories in CKD.

GFR category	GFR (ml/min/1.73 m^2)	Terms
G1	>90	Normal or high
G2	60–89	Mildly decreased
G3a	45–59	Mildly or moderately decreased
G3b	30–44	Moderately or severely decreased
G4	15–29	Severely decreased
G5	<15	Kidney failure

Albuminuria category	AER (mg/24 h)	UACR (approximately equivalent)		Terms
		mg/mmol	mg/g	
A1	<30	<3	<30	Normal or mildly increased
A2	30–300	3–30	30–300	Moderately increased
A3	>300	>30	>300	Severely increased

AER: albumin excretion rate.
In the absence of evidence of kidney damage, neither G1 nor G2 fulfils the criteria for CKD.
Adapted from Kidney Disease: Improving Global Outcomes CKD Work Group. KDIGO 2024 clinical practice guideline for the evaluation and management of chronic kidney disease. Kidney Int 2024;105(4S):S117–314.

The Global Burden of CKD

The Global Burden of CKD

- CKD affects around **13% of the global population**.
- Prevalence rises sharply in adults over sixty years.(19.3%)
- Higher rates occur with diabetes, hypertension, and obesity.
- Over **850 million people** are currently living with CKD.
- Prevalence continues increasing with population aging worldwide.

The Global Burden of CKD

- 2024 Global Burden of Disease report confirms alarming trends.
- CKD ranked **11th leading cause of death** in 2021.
- Causes **1.53 million direct deaths annually** worldwide.
- An additional **2.1 million deaths** from cardiovascular disease linked to CKD.
- Together these make CKD the **eighth major global risk factor**.
- By 2050, CKD expected to become **fifth leading cause of death**.

Economic Burden

- CKD generates enormous health and social costs globally.
- In 2018, **U.S. costs exceeded $81.8 billion annually**.
- **CKD:** 22% of Medicare spending; **Kidney failure:** 7%.
- Europe reports **over €140 billion yearly in societal costs**.
- These exclude losses from **reduced productivity** and **disability**.

Environmental Burden

- Dialysis treatment produces significant greenhouse gas emissions.
- Generates large amounts of **plastic and water waste** yearly.
- Reducing CKD progression lessens healthcare’s environmental impact.
- Prevention improves both **human health** and **planetary health**.

Risk of Developing CKD

Major Traditional Risk Factors

- **Hypertension, diabetes, obesity, and cardiovascular disease** dominate.
- These conditions account for most global CKD burden.
- Each factor independently increases risk of kidney damage.
- Risk grows when multiple metabolic disorders coexist together.
- CKD often develops silently in these chronic conditions.

Cardiovascular–Kidney–Metabolic (CKM) Multimorbidity

- CKM syndrome combines **cardiac, renal, and metabolic disease**.
- Shared pathways accelerate organ injury and systemic inflammation.
- One-quarter to two-fifths of diabetics develop chronic kidney disease.
- About **30% of hypertensive adults** show kidney dysfunction signs.
- Nearly **37% of cardiovascular patients** also have CKD.
- 17% of obese adults have CKD.
- **50% of heart failure patients** also have kidney disease.
- Up to 70% of patients with CKD have clinical or pre clinical heart failure.

Non-Traditional Risk Factors

- Include drugs, toxins, infections, and environmental exposures.
- **Nephrotoxic medications** (NSAIDs, contrast media, chemotherapy) cause injury.
- **Herbal and alternative treatments** can trigger kidney damage.
- **Hyperuricemia** and **recurrent kidney stones** raise CKD risk.
- **Maternal and fetal exposures** affect lifelong kidney health.
- **Dehydration, heat, and climate change** worsen kidney stress.
- **Acute kidney injury (AKI)** episodes increase future CKD likelihood.

CKD and the risk of progression to kidney failure

Determinants of Progression

- Progression risk rises with **lower GFR and higher albuminuria**.
- Both markers independently predict kidney failure development.
- Combining GFR and albuminuria enhances risk stratification accuracy.
- These variables form the foundation of risk assessment tools.
- CKD progression can often be slowed with early action.

Risk Classification: The Heatmap Concept

- KDIGO introduced a **heatmap combining GFR and UACR values**.
- Each cell represents different levels of progression risk.
- Heatmap guides treatment intensity and monitoring frequency.
- Color coding ranges from green (low) to red (very high).
- Helps non-nephrologists easily interpret CKD severity categories.
- European Renal Association supports simplified mild–moderate–severe labels.

			Albuminuria categories		
			A1	A2	A3
			<30 mg/g	30-299 mg/g	≥300 mg/g
GFR categories (ml/min/1.73m²)	G1	≥90		Mild CKD	Moderate CKD
	G2	60-89		Mild CKD	Moderate CKD
	G3a	45-59	Mild CKD	Moderate CKD	Severe CKD
	G3b	30-44	Moderate CKD	Severe CKD	Severe CKD
	G4	15-29	Severe CKD	Severe CKD	Severe CKD
	G5	<15	Severe CKD / Kidney failure	Severe CKD / Kidney failure	Severe CKD / Kidney failure

Low risk (if no other markers of kidney disease, no CKD)

Moderately increased risk

High risk

Very high risk

CKD, chronic kidney disease; GFR, glomerular filtration rate.

Figure 1: Risk of progression of CKD by GFR and albuminuria. Adapted from Kidney Disease: Improving Global Outcomes CKD Work Group. KDIGO 2024 clinical practice guideline for the evaluation and management of chronic kidney disease. *Kidney Int* 2024;105(4S):S117–314.

Box 1: Jean and Juan are both 60-year-old men with severe CKD category G3bA2 with identical GFRs. However, Juan has a higher UACR, thus Juan has a much higher risk of progression to kidney failure.

Jean
- 60-year-old man
- Severe CKD category G3bA2
- GFR 30 ml/min/1.73 m^2
- UACR 30 mg/g

Risk of kidney failure at
- 2 years = 1.4%
- 5 years = 5.1%

Juan
- 60-year-old man
- Severe CKD category G3bA2
- GFR 30 ml/min/1.73 m^2
- UACR 299 mg/g

Risk of kidney failure at
- 2 years = 4.0%
- 5 years = 13.6%

Risk of progression to kidney failure estimated using the Kidney Failure Risk Equation (https://kidneyfailurerisk.com).

Several risk prediction equations have beed developed and validated.

https://kidneyfailurerisk.com

CKD and CVD

CKD is associated with increased morbidity and mortality from CVD, especially if diabetes mellitus is also present (CKM multimorbidity).However, what is perhaps not appreciated is that this increased risk begins with both mildly reduced GFR and low levels of albuminuria and increases exponentially with worsening GFR and albuminuria independent of each other.

Cardiovascular risk prediction tools developed in the general (non-CKD) population consistently underestimate risk at an individual level. New risk estimation equations have been developed specifically for adults with CKD. Several cardiovascular prevention guidelines consider CKD as a disease-modifying risk factor and will automatically classify patients with different levels of CKD as having high or very high risk of CVD and recommend risk-modifying therapies accordingly.

Cardiovascular Mortality

	Urine albumin-creatinine ratio (mg/g)				
GFR	<10	10-29	30-299	300-999	>1000
90-104	ref	1	2	2	4
60-89	1	1	2	2	3
45-59	1	2	2	3	4
30-44	2	2	3	4	5
15-29	3	3	4	5	7
<15	6	6	6	7	8

CKD and all-cause mortality

CKD is associated with multiple other comorbidities in addition to being part of the CKM syndrome ranging from infection to cancer and disproportionately affecting young adults.

CKD is also associated with an increased risk of premature death that can also be expressed as a heatmap. The increased risk of premature death is not solved by KRT, as life expectancy may be reduced up to 44 years (dialysis) or 22 years (kidney transplantation) in young adults when compared with the general population.

All-Cause Mortality

	Urine albumin-to-creatinine ratio (mg/g)				
GFR	**<10**	**10-29**	**30-299**	**300-999**	**>1000**
90-104	ref	1	2	3	3
60-89	1	1	2	2	3
45-59	1	2	2	2	3
30-44	2	2	3	3	4
15-29	3	3	3	4	6
<15	5	5	5	6	7

Figure 2: Associations of CKD staging by GFR by serum creatinine and UACR categories and risk of all-cause and cardiovascular mortality. Numbers reflect the adjusted hazard ratio compared with the reference cell. Adjustment variables included age, sex, smoking status (current, former or never), systolic BP, total cholesterol, high-density lipoprotein cholesterol, body mass index, use of antihypertensive medications and a medical history of diabetes, coronary heart disease, stroke, heart failure, atrial fibrillation, peripheral artery disease, cancer or chronic obstructive pulmonary disease. Adapted from Kidney Disease: Improving Global Outcomes CKD Work Group. KDIGO 2024 clinical practice guideline for the evaluation and management of chronic kidney disease. Kidney Int 2024;105(4S):S117–314.

Awareness of CKD—mobilizing patient power?

- CKD awareness remains poor across all healthcare systems.
- eGFR is auto-reported, yet under-recognized by clinicians.
- Many patients remain undiagnosed despite available test results.
- Albuminuria testing (UACR) rarely performed in primary care.
- In Europe, UACR testing ranged from only 1.3% to 33.4%.
- Awareness gaps exist among professionals and general public.

Causes of Low Awareness

- Belief that early CKD detection changes little in care.
- Guidelines exist but remain inconsistently implemented worldwide.
- Language barriers limit understanding of international recommendations.

Consequences of Unawareness

- Missed opportunities for early intervention and prevention.
- Underuse of **ACE inhibitors** and **ARBs** despite strong evidence.
- Slow adoption of **SGLT2 inhibitors**, **GLP-1 receptor agonists**, **nsMRAs**.
- Delayed treatment leads to higher morbidity and mortality.
- Over-prescription of nephrotoxic drugs persists without awareness.

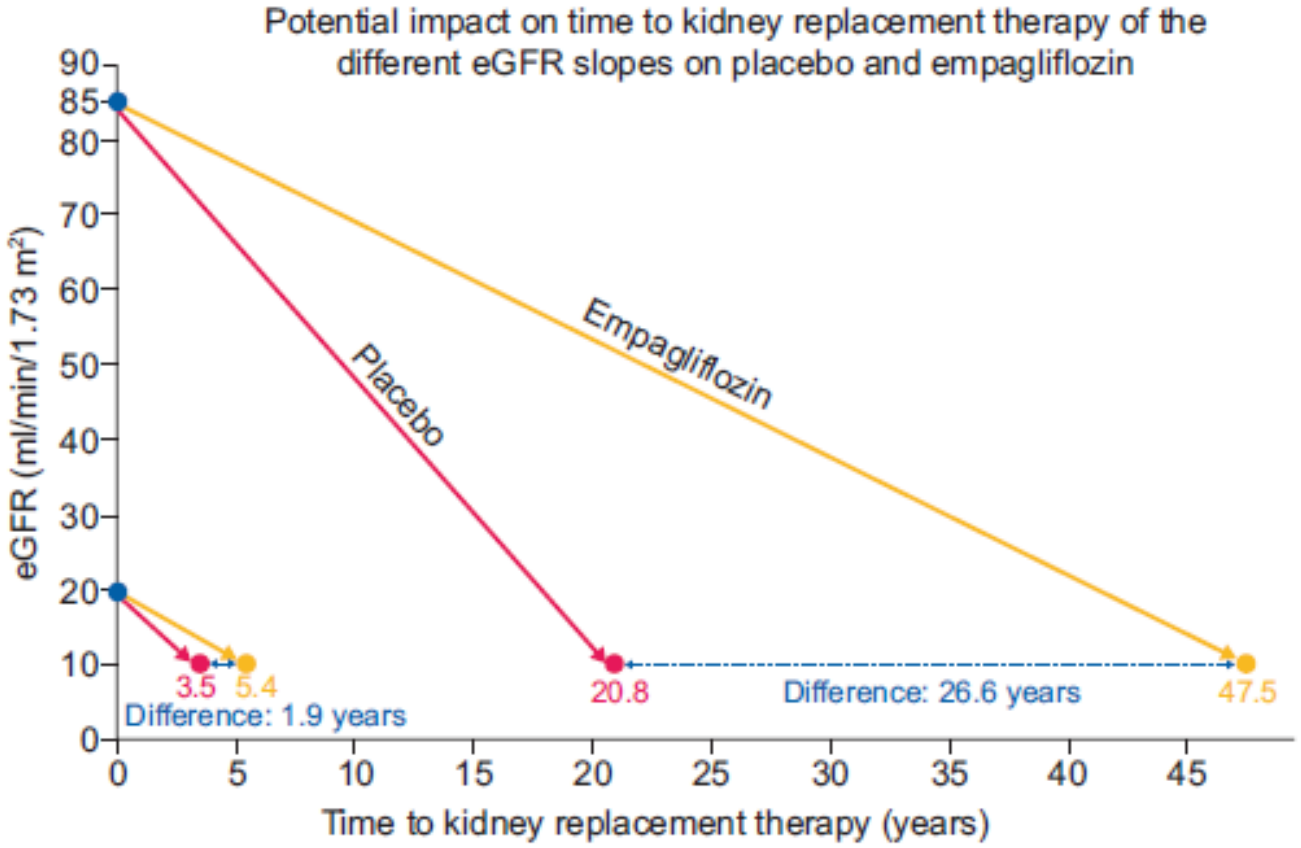


Figure 3: Hypothetical transformation of chronic eGFR slopes into time to kidney failure, defined as GFR 10 ml/min/1.73 m^2, in the EMPA-KIDNEY trial. Time to kidney failure according to baseline GFR was estimated from each baseline eGFR value by applying the chronic eGFR slopes corresponding to participants on placebo and on empagliflozin within the pre-specified GFR subgroups (GFR cut-off points to define subgroups set at 30 and 45 ml/min/1.73 m^2) as per reference. The delay in time (years) to kidney failure on empagliflozin versus placebo, according to baseline eGFR, was obtained by subtracting the time to kidney failure on empagliflozin from the time to kidney failure on placebo. This conceptual model assumes that patients will live up to the point where they need kidney replacement therapy and that chronic GFR slopes observed in the clinical trial are maintained stable beyond the duration of the trial. Reproduced from Fernandez-Fernandez B, Sarafidis P, Soler MJ, Ortiz A. EMPA-KIDNEY: expanding the range of kidney protection by SGLT2 inhibitors. Clin Kidney J 2023;16:1187–1198.

- Training primary-care physicians improves CKD detection significantly.
- Italian study: education increased rates of UACR and GFR testing.
- Detected CKD prevalence nearly doubled in high-risk patients.
- Most gains seen in diabetes, hypertension, and heart failure groups.
- Demonstrates that clinician education translates to earlier diagnosis.

Box 3: Three categories that define early risk for chronic kidney disease.

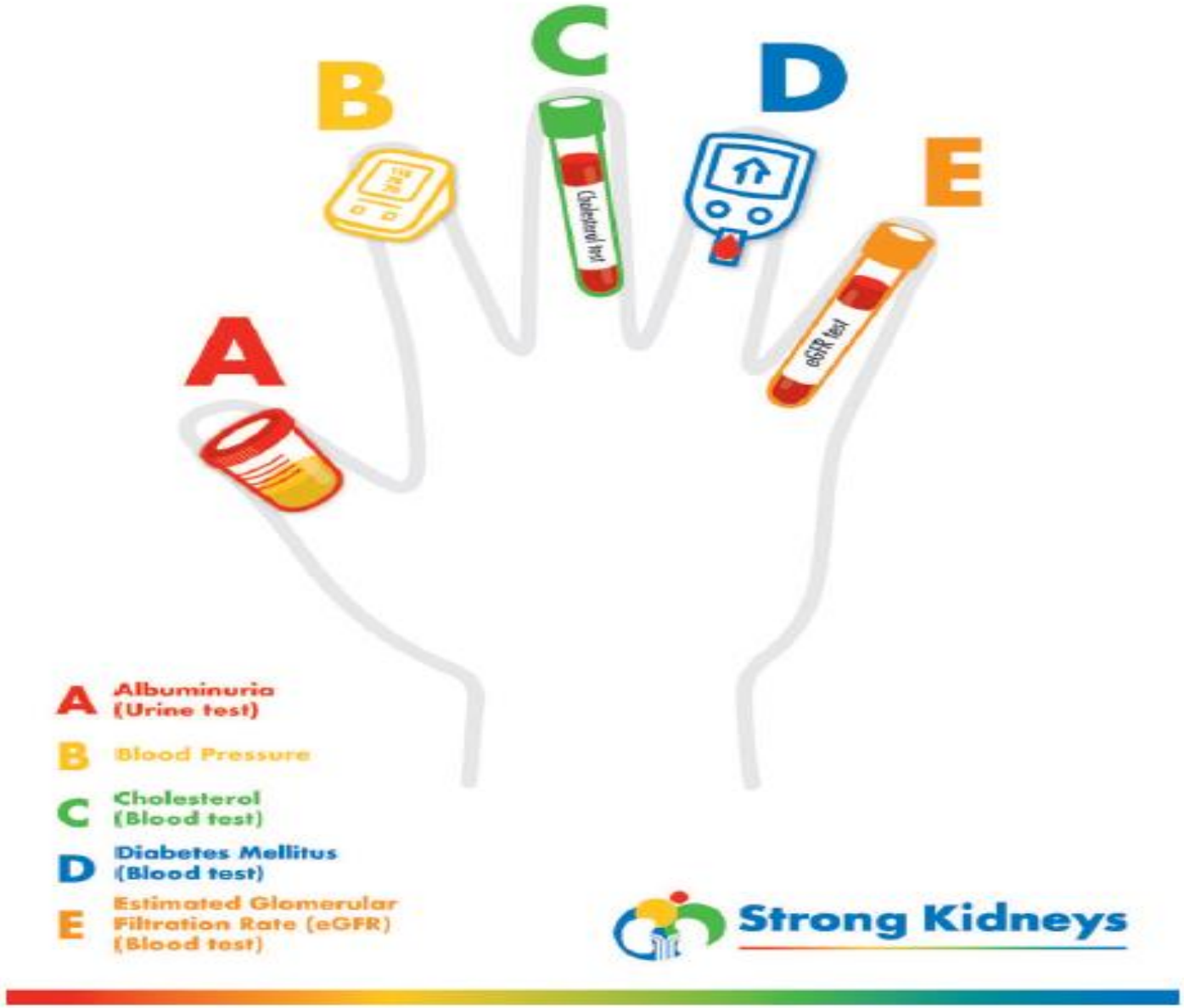
1. Metabolic diseases
   a. Type 1 and type 2 diabetes mellitus
   b. Pre-diabetes, gestational diabetes
   c. Steatotic liver disease
   d. Morbid obesity
   e. Any type of cardiovascular disease
   f. Gout
   g. Multisystem diseases with potential kidney involvement (e.g. systemic lupus erythematosus)
2. Familial, intrinsic, extrinsic and multifactorial conditions
   a. Family history of chronic kidney disease
   b. Ethnic minorities
   c. Premature birth (low gestational age/low birth weight)
   d. Hypertension, pre-eclampsia
   e. Congenital abnormalities of the kidneys and urinary tract (CAKUT)
   f. Unilateral nephrectomy
   g. Recurrent kidney stones
   h. Incidental detection of haematuria or albuminuria
3. Environmental
   a. Toxins (e.g. air pollution)
   b. Medication (non-steroidal anti-inflammatory drugs, lithium, calcineurin inhibitors)
   c. Previous episode of acute kidney injury
   d. Young rural males in Central America

Concept of the ABCDE campaign

- Initiative by the **Strong Kidneys Task Force (ERA)**.
- Designed to **simplify CKD prevention and awareness globally**.
- Uses five key questions addressing major CKD risk factors.
- Empowers patients to engage with their healthcare providers.
- Aligns kidney health with cardiovascular and metabolic prevention.

- **A — Albuminuria:** “Do I have protein in my urine?”
- **B — Blood Pressure:** “What is my blood pressure reading?”
- **C — Cholesterol:** “What are my cholesterol levels currently?”
- **D — Diabetes:** “Do I have or risk developing diabetes?”
- **E — Estimated GFR:** “What is my kidney function result?”

Know your ABCDEs



Albuminuria:

- **Urine albumin measurement** is preferred over total protein testing.
- It is **more sensitive** for detecting glomerular permeability changes.
- Especially useful in **hypertension and diabetes–related kidney damage**.
- **Albumin-to-creatinine ratio (UACR)** from a **spot urine sample** is standard.
- UACR corrects for urine concentration and reduces variability.
- **First morning sample** preferred, but random samples acceptable.
- **24-hour urine collections** are no longer required.
- **Dipstick testing** is quick but lacks accuracy and sensitivity.
- **Semi-quantitative automated UACR** may be used when resources are limited.

BP:

- **1.4 billion people** worldwide have hypertension (>140/90 mmHg).
- **Half** are unaware of their condition; only **20%** have controlled BP.
- Hypertension is the **second leading cause of CKD** after diabetes.
- It is an **independent, modifiable risk factor** for CKD progression.
- **Up to 25%** of treated hypertensive patients develop albuminuria.
- Hypertension is also a **common consequence** of existing CKD.
- BP should be **measured per international guidelines**.
- Target BP: **≤130/80 mmHg**, or lower if tolerated.
- **ACE inhibitors or ARBs** are first-line for patients with albuminuria, CVD, or diabetes.

Cholesterol:

- People with **CKD have increased cardiovascular disease (CVD) risk**.
- Risk is especially high within the **CKM multimorbidity syndrome**.
- Those **at risk or with CKD** should have a **full lipid profile** checked.
- Lipid profile includes **total, LDL, HDL cholesterol and triglycerides**.
- **Moderate to severe CKD** is considered **high or very high CVD risk**.
- Such patients should receive **statin or statin + ezetimibe therapy**.
- For others, use **risk equations including GFR and albuminuria**.
- Treatment should follow cardiovascular risk stratification results.

Diabetes:

- **Diabetes is the most common global cause of CKD.**
- Urgent need exists to reduce diabetes and its complications.
- **537 million people** have diabetes worldwide; **90% have type 2.**
- Another **541 million** have impaired glucose tolerance or prediabetes.
- Nearly **half of all diabetics are undiagnosed.**
- **40–50%** of people with diabetes develop chronic kidney disease.

eGFR:

- **Serum creatinine alone** is unreliable for assessing kidney function.
- It varies with **age, sex, and muscle mass**, causing misinterpretation.
- Use **estimating equations** that adjust for age and sex.
- eGFR is recommended for **diagnosis, staging, and monitoring** of CKD.

The Future

- **CKD management has been transformed** by new effective therapies.
- CKD is now recognized as part of the **CKM multimorbidity syndrome**.
- The era of **therapeutic nihilism ("renalism")** is over.
- **Large trials** now include patients with CKD and major endpoints.
- Evidence supports multiple **prognostic therapies** for CKD.
- The **four pillars of CKD treatment** are:
  - **ACE inhibitors / ARBs**
  - **SGLT2 inhibitors**
  - **GLP-1 receptor agonists**
  - **Non-steroidal mineralocorticoid receptor antagonists (nsMRAs)**
- Used alone or together, these **reduce cardiovascular events, CKD progression, and mortality**.
- **Equity of access** to these drugs is essential globally.
- *Saving kidneys saves hearts and saves lives.*

Thanks for Your Attention