

A PRIMARY CARE APPROACH TO CHRONIC KIDNEY DISEASE

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PRIMARY CARE PROVIDERS ARE THE FIRST LINE OF DEFENSE AGAINST CKD



Individuals at risk for CKD are highly prevalent in primary care practices



Primary care professionals can play a significant role in early diagnosis, treatment, and patient education.



A greater emphasis on detecting CKD, and managing CKD prior to referral, can improve patient outcomes.



CKD care is Primary Care

LEARNING OBJECTIVES



Recognize those who are risk for CKD



Apply appropriate diagnostic criteria for CKD



Articulate a thorough evaluation to your patients with CKD



Appraise strategies to slow progression of CKD

THE PROBLEM OF CHRONIC KIDNEY DISEASE

Common, Serious and Expensive

CKD Is Common Among US Adults

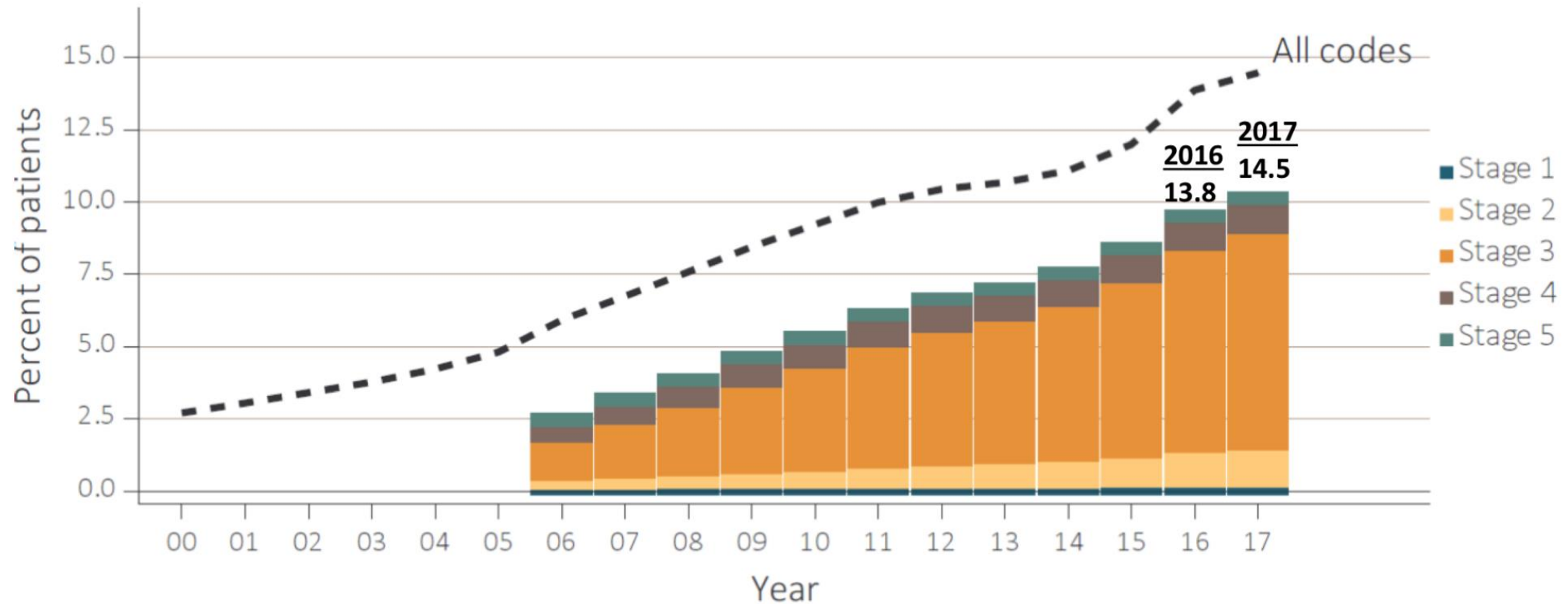
Fast Stats

- 15% of US adults—37 million people—are estimated to have CKD.*
- Most (9 in 10) adults with CKD do not know they have it.
- 1 in 2 people with very low kidney function who are not on dialysis do not know they have CKD.

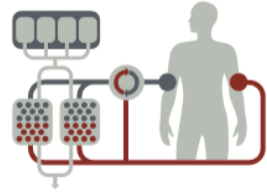


CDC Chronic Kidney Disease Initiative
<https://www.cdc.gov/kidneydisease/>

Figure 1: Trends in prevalence of recognized CKD, overall and by CKD stage, among Medicare patients (aged 65+ years), 2000-2017

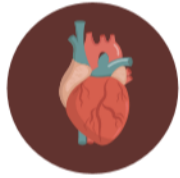


Kidney diseases are the **9TH LEADING CAUSE OF DEATH** in the United States



EVERY DAY MORE THAN
340 people begin treatment for kidney failure
(dialysis or a kidney transplant)

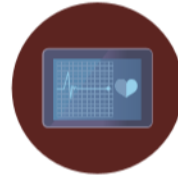
CKD INCREASES RISK FOR:



Heart disease
and heart failure



Stroke



Early
death

MEDICARE COSTS



CKD =

\$84 BILLION



ESKD =

\$36 BILLION



THE CASE OF MR. H

- 72 yo AA male who presents to your clinic for an initial visit
- No complaints
- HTN, DM, HFpEF, CAD, GERD
- Amlodipine, Metoprolol, Omeprazole, Atorvastatin, Metformin, ASA
- BP 150/80
- BMI 35
- ***Is Mr. H at risk for CKD?***

CKD RISK FACTORS

Modifiable

- Diabetes
- Hypertension
- CVD/PVD
- History of AKI
- Frequent NSAID or other nephrotoxic drug use
- Structural renal tract disease
- Multisystem diseases with potential renal involvement
- Obesity
- Tobacco use

Non-Modifiable

- Family history of kidney disease, diabetes, or hypertension
- Age 60 or older
- Race/U.S. ethnic minority status

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- BMI 35
- ***He is at risk, but does he have CKD?***

DEFINITION OF CKD

- Abnormalities of kidney function or marker of kidney damage **present for >3 months**
 - Decreased eGFR: $<60 \text{ mL/min/1.73m}^2$ AND/OR
 - Marker of kidney damage
 - ACR $>30 \text{ mg/g}$
 - Urine sediment abnormalities
 - Electrolytes and other abnormalities due to tubular disorders
 - Abnormalities detected by histology
 - Structural abnormalities detected by imaging
 - History of kidney transplantation..



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REVISED CKD CLASSIFICATION KDIGO 2012

- Improved Risk Stratification and Prognosis
 - Albuminuria Stages
 - GFR stages (3a, 3b)
 - Establish a Cause

Revised chronic kidney disease classification based upon upon glomerular filtration rate and albuminuria

GFR stages	GFR (mL/min/1.73 m ²)	Terms
G1	>90	Normal or high
G2	60 to 89	Mildly decreased
G3a	45 to 59	Mildly to moderately decreased
G3b	30 to 44	Moderately to severely decreased
G4	15 to 29	Severely decreased
G5	<15	Kidney failure (add D if treated by dialysis)
Albuminuria stages	AER (mg/day)	Terms
A1	<30	Normal to mildly increased (may be subdivided for risk prediction)
A2	30 to 300	Moderately increased
A3	>300	Severely increased (may be subdivided into nephrotic and non-nephrotic for differential diagnosis, management, and risk prediction)

The cause of CKD is also included in the KDIGO revised classification but is not included in this table.

GFR: glomerular filtration rate; AER: albumin excretion rate; CKD: chronic kidney disease; KDIGO: Kidney Disease Improving Global Outcomes.

Data from:

1. KDIGO. Summary of recommendation statements. *Kidney Int* 2013; 3 (Suppl):5.
2. National Kidney Foundation. K/DOQI clinical practice guidelines for chronic kidney disease: evaluation, classification, and stratification. *Am J Kidney Dis* 2002; 39 (Suppl 1):S1.

**Prognosis of CKD by GFR
and Albuminuria Categories:
KDIGO 2012**

				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-300 mg/g 3-30 mg/mmol	>300 mg/g >30 mg/mmol
GFR categories (ml/min/1.73m ²) Description and range	G1	Normal or high	≥90			
	G2	Mildly decreased	60-89			
	G3a	Mildly to moderately decreased	45-59			
	G3b	Moderately to severely decreased	30-44			
	G4	Severely decreased	15-29			
	G5	Kidney failure	<15			



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- HTN, DM, HFpEF, CAD, GERD
- Amlodipine, Metoprolol, Omeprazole, Atorvastatin, Metformin, ASA
- BP 150/80
- BMI 35
- Cr 1.5 (eGFR 58=>49 cc/min) over last 2 years
- ACR 525 mg/g
- ***What is the cause of his CKD?***

Table 4 | Classification* of CKD based on presence or absence of systemic disease and location within the kidney of pathologic-anatomic findings

	Examples of systemic diseases affecting the kidney	Examples of primary kidney diseases (absence of systemic diseases affecting the kidney)
Glomerular diseases	Diabetes, systemic autoimmune diseases, systemic infections, drugs, neoplasia (including amyloidosis)	Diffuse, focal or crescentic proliferative GN; focal and segmental glomerulosclerosis, membranous nephropathy, minimal change disease
Tubulointerstitial diseases	Systemic infections, autoimmune, sarcoidosis, drugs, urate, environmental toxins (lead, aristolochic acid), neoplasia (myeloma)	Urinary-tract infections, stones, obstruction
Vascular diseases	Atherosclerosis, hypertension, ischemia, cholesterol emboli, systemic vasculitis, thrombotic microangiopathy, systemic sclerosis	ANCA-associated renal limited vasculitis, fibromuscular dysplasia
Cystic and congenital diseases	Polycystic kidney disease, Alport syndrome, Fabry disease	Renal dysplasia, medullary cystic disease, podocytopathies

Abbreviations: ANCA, antineutrophil cytoplasmic antibody; CKD, chronic kidney disease, GN, glomerulonephritis

Genetic diseases are not considered separately because some diseases in each category are now recognized as having genetic determinants.

*Note that there are many different ways in which to classify CKD. This method of separating systemic diseases and primary kidney diseases is only one, proposed by the Work Group, to aid in the conceptual approach.

CAUSE CLASSIFICATION



CKD EVALUATION FRAMEWORK

Duration and trajectory

Urine studies

Medications

Imaging

Risk factors

Complications

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- BP 150/80
- BMI 35
- Cr 1.3=>1.5 (eGFR 58=>49 cc/min) over last 2 years
- ACR 355 mg/g

Duration and trajectory: Cr .7 in 2010, 1.0 in 2015, 1.3 in 2018, 1.5 in 2020

Urine studies: UA complete no blood, tr-2+ protein since 2015, ACR 34 in 2007, 256 in 2015, 525 in 2020

Medications: No NSAIDs, PPI since 2017

Imaging: No renal ultrasound or abdominal CT scans, no bladder scans

Risk factors: HTN (140-160s/ in office), DM (HbA1c 8-10%), PVD (statin), PPI use, Obesity

Complications: HTN, No anemia, normal K and bicarb, normal Ca, phos

WHAT IS YOUR DIAGNOSIS?

What can we do to slow
progression of his CKD?

TARGET RISK FACTORS

HTN (140-160s/ in office)

DM (HbA1c 8-10%)

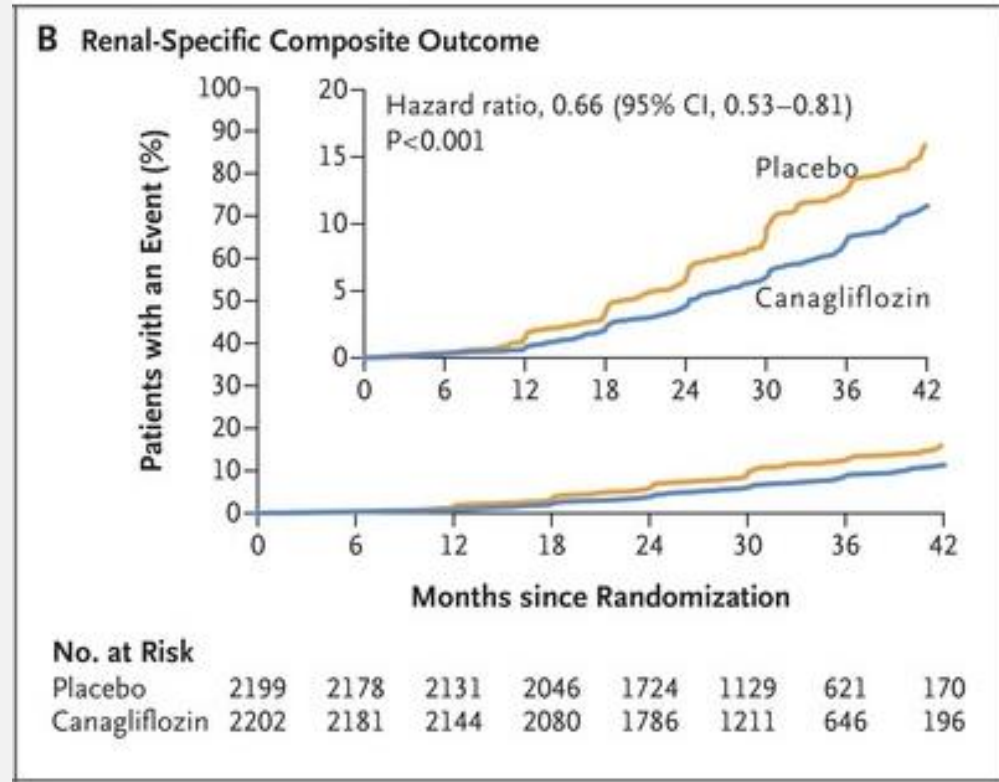
PVD on statin

PPI use

Obesity, BMI 35

CREDENCE TRIAL

- RCT of Canagliflozin (SGLT2 inhibitor) in CKD
 - eGFR 30- 90 ml/ min and UACR > 300 mg/g on ACEI/ARB
 - Primary renal outcomes
 - 4400 patients over 2.6 years
- Results
 - Composite of end-stage kidney disease, doubling serum Cr, or renal death lower by 34%



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- Cr 1.3=>1.5 (eGFR 58=>49 cc/min) over last 2 years
- ACR 355 mg/g
- ***What is your treatment recommendation?***

NOW *YOU* ARE NOW THE
FIRST LINE OF DEFENSE AGAINST CKD

- Sustained AKI or AKI on CKD
- Unclear cause of AKI or CKD
- Persistent albuminuria (ACR >300 mg/g) of unclear cause
- Atypical Progression of CKD
- Active urine sediment: Dysmorphic red blood cells or casts, white blood cells casts in absence of infection and not due to GU cause
- Hypertension refractory to treatment with multiple antihypertensive agents
- Persistent abnormalities of serum potassium
- Recurrent or extensive nephrolithiasis
- Unable to manage complications of CKD



WHEN TO
REFER TO A
NEPHROLOGIST

SUMMARY

CKD is a significant health problem

Early CKD identification of high-risk individuals and appropriate diagnosis can slow progression

Application of an evaluation framework to establish a cause and improve management

Nephrology referral when appropriate

Primary Care is CKD care

QUESTIONS?

Thank you,
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