CKD SCREENING, DIAGNOSIS & MGMT

Ben Collins-Hamel, D.O.

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Pre-Test

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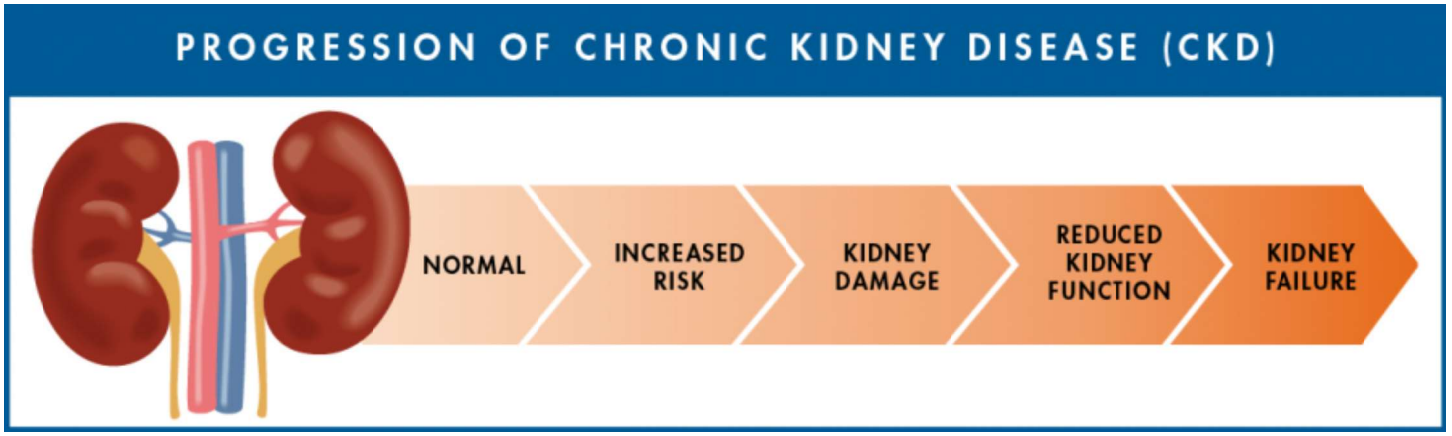
What is CKD?

- **Chronic Kidney Disease** is the loss of kidney function over time. CKD can lead to heart attack, stroke, anemia, kidney failure and death.
- Usually there are no symptoms of CKD until the later stages.
- There is no cure for CKD, but **progression may slow down** with early detection, medication, healthy eating and exercise.
- End-stage renal disease (ESKD), or **kidney failure** requires dialysis or a transplant.



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WHY FOCUS ON CKD?

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Common

Under-recognized

Deadly

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Common

Under-recognized

Deadly

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How common?

One in seven adults in Michigan have CKD disease.

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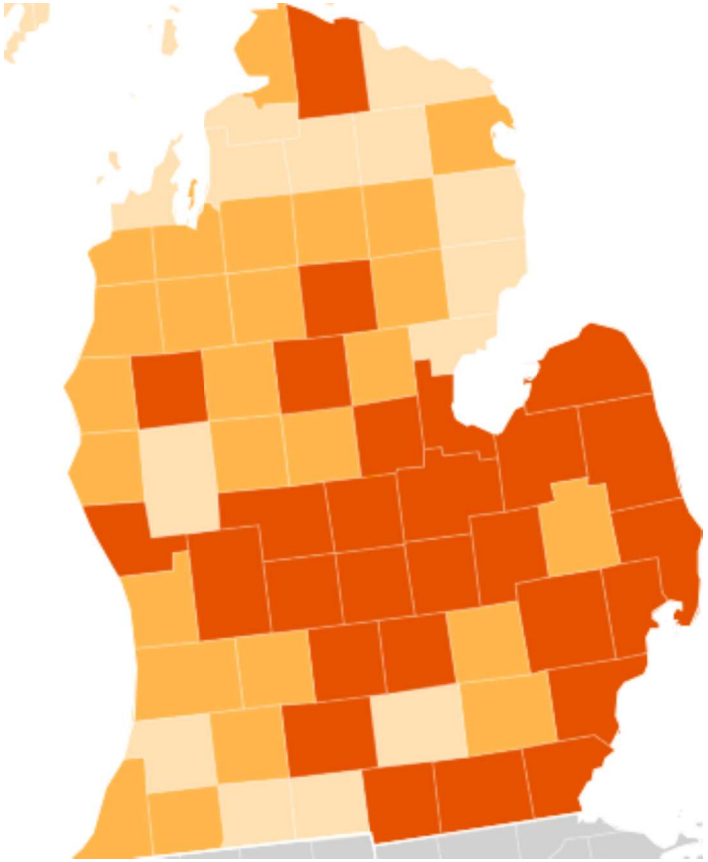
Prevalence of Diagnosed Chronic Kidney Disease by County in Medicaid Adults

- Among adult Michigan Medicaid beneficiaries, 8.3% have been diagnosed with CKD.

- Among Medicare beneficiaries, 25.7% have been diagnosed with CKD.



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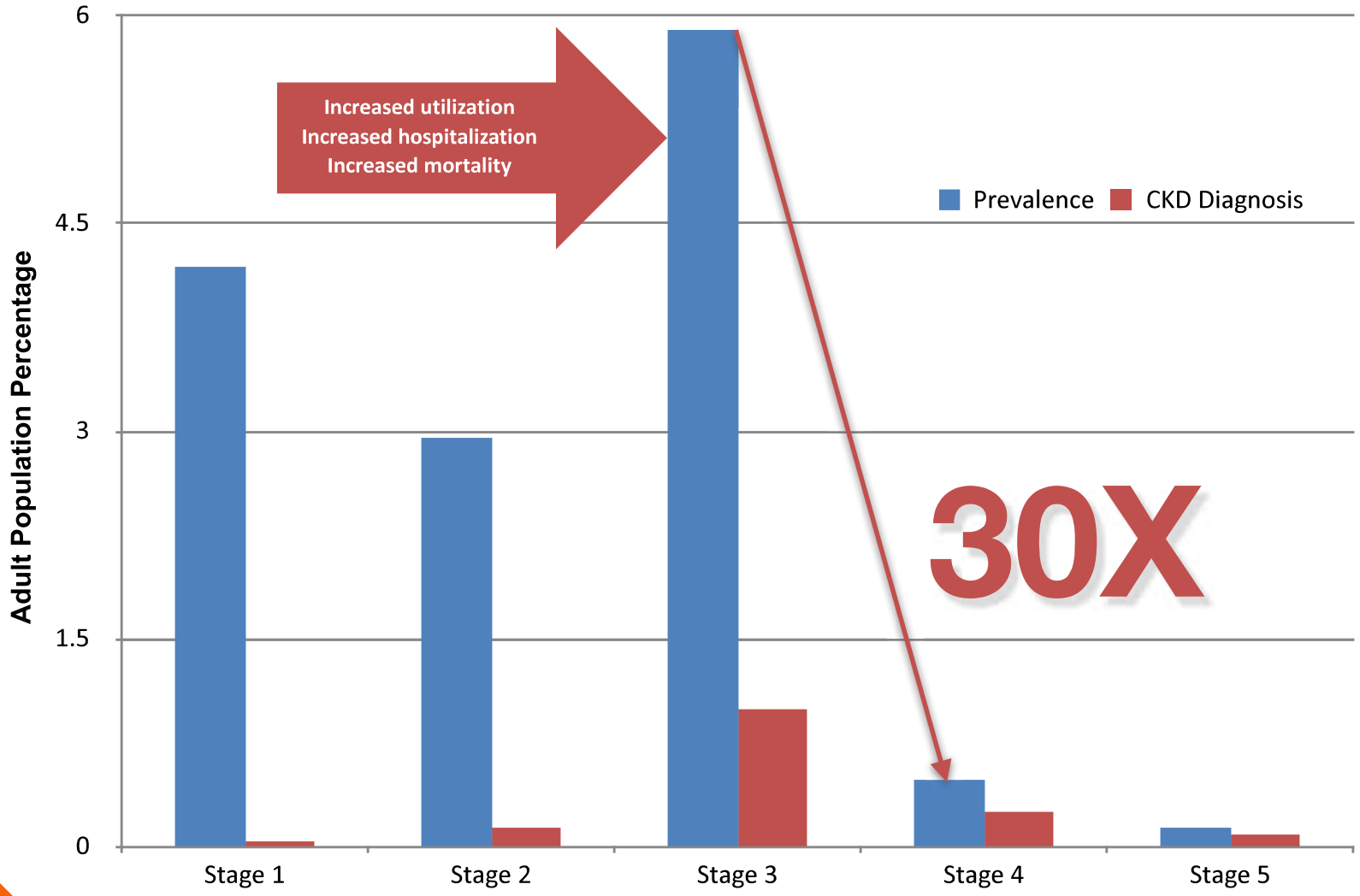
CKD Prevalence & Diagnosis by Stage



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Deadly

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How fatal?

Kidney disease is the 9th leading cause of death in the U.S.

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Question

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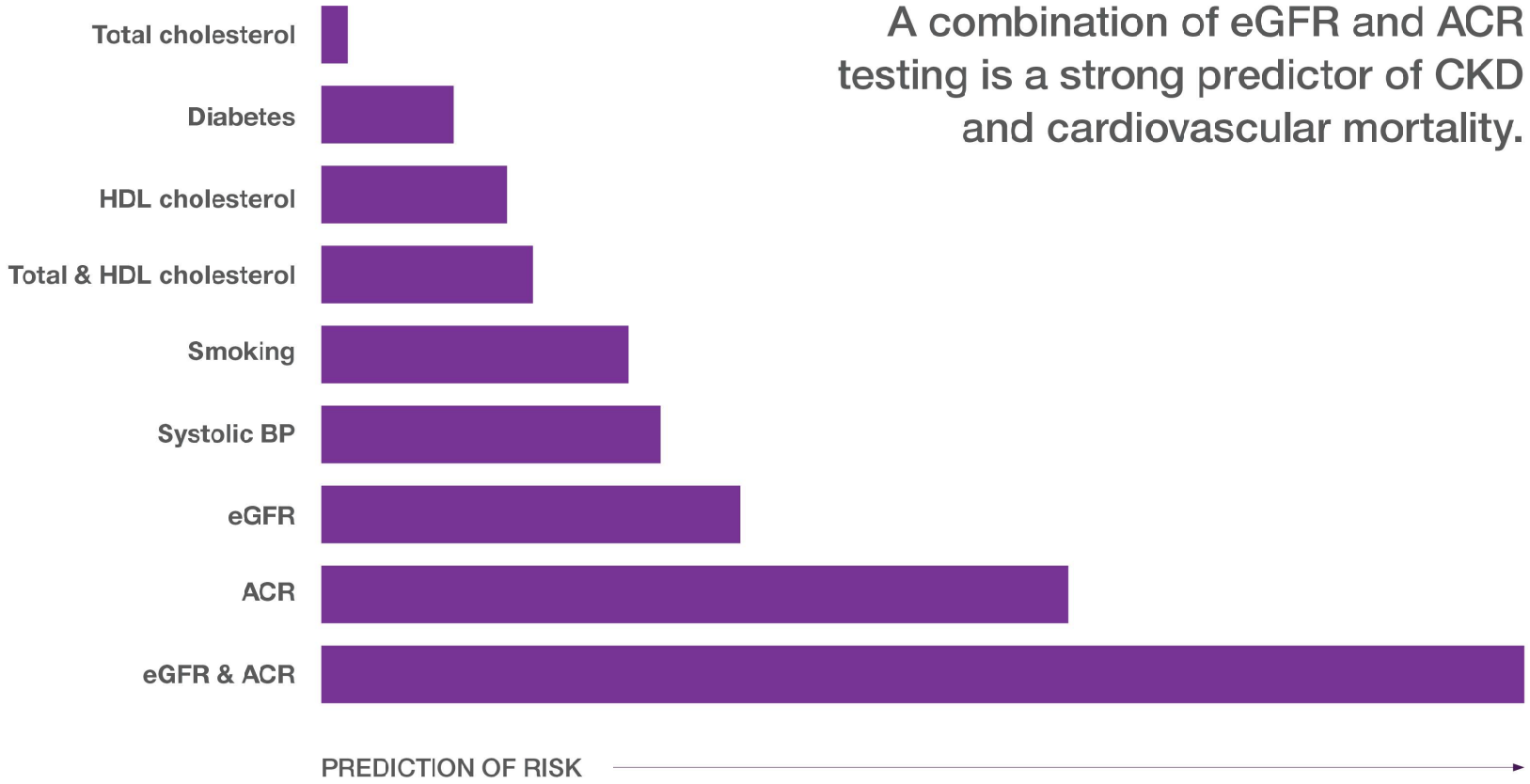
CKD and Prediction of Cardiovascular Mortality



A combination of eGFR and ACR testing is a strong predictor of CKD and cardiovascular mortality.

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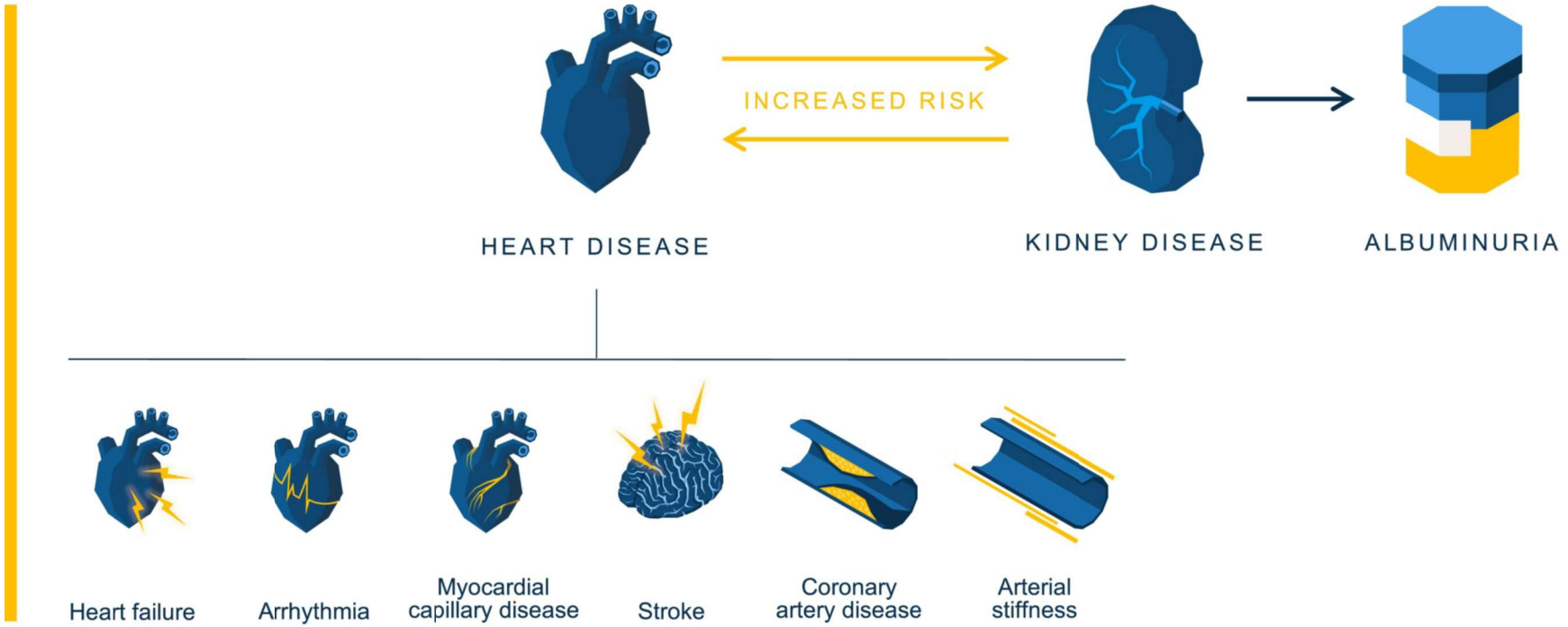
Albuminuria & CVD Risk

INCREASED RISK of albuminuria and risk of CVD



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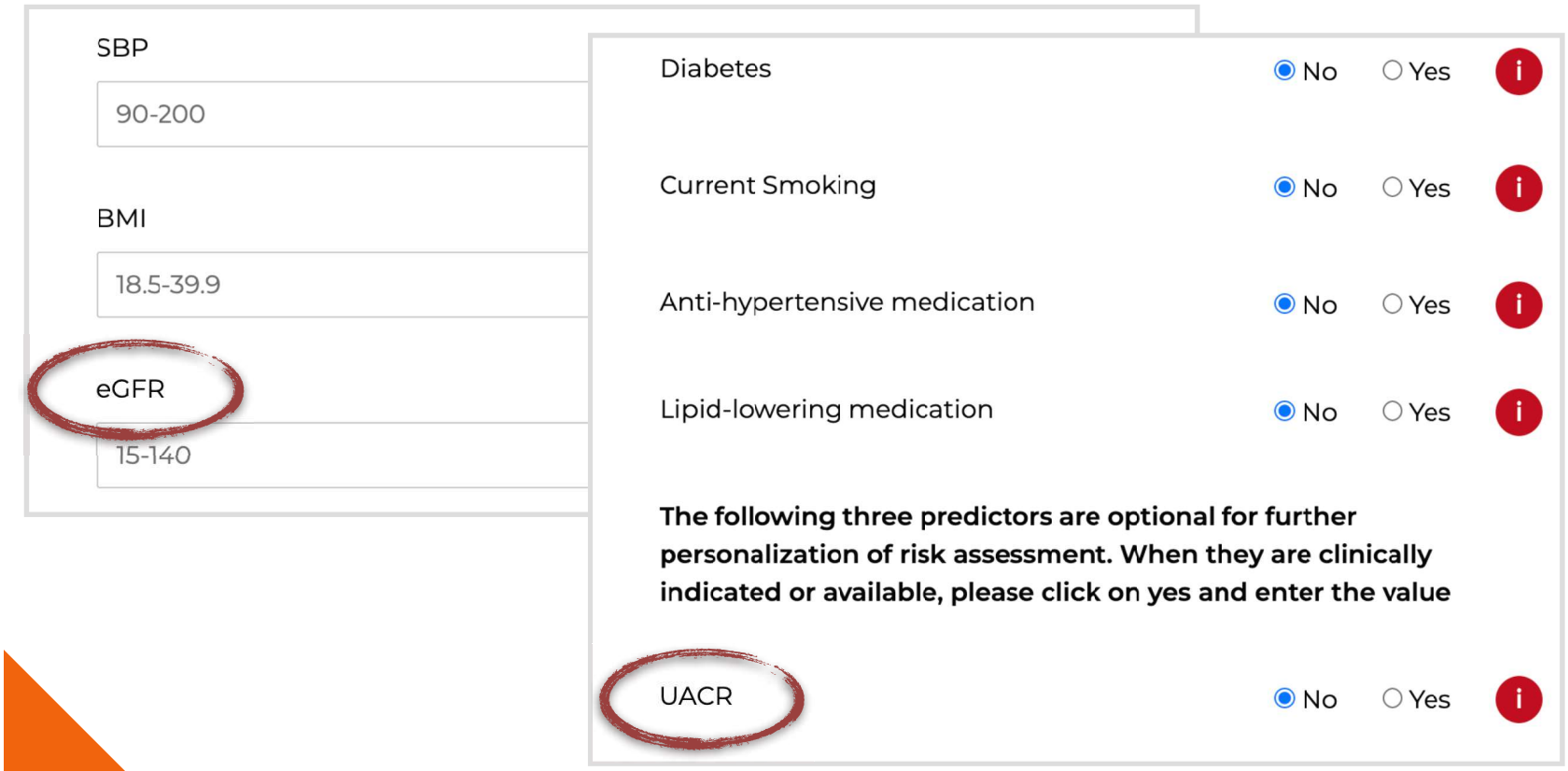
The American Heart Association PREVENT™ Online Calculator

Welcome to the American Heart Association **Predicting Risk of cardiovascular disease EVENTs** (PREVENT™). This app should be used for primary prevention patients (those without atherosclerotic cardiovascular disease or heart failure) only.



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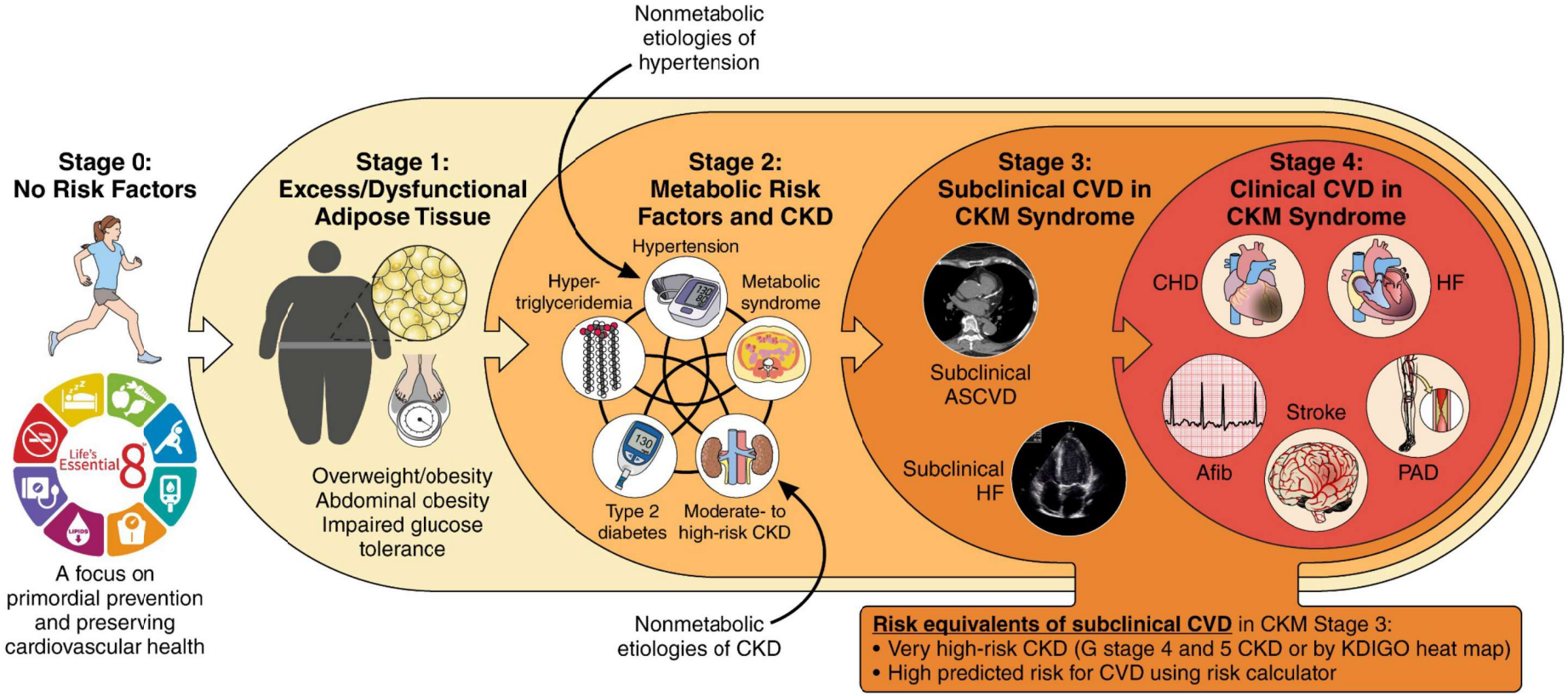
Cardiovascular-Kidney-Metabolic Syndrome (CKM)



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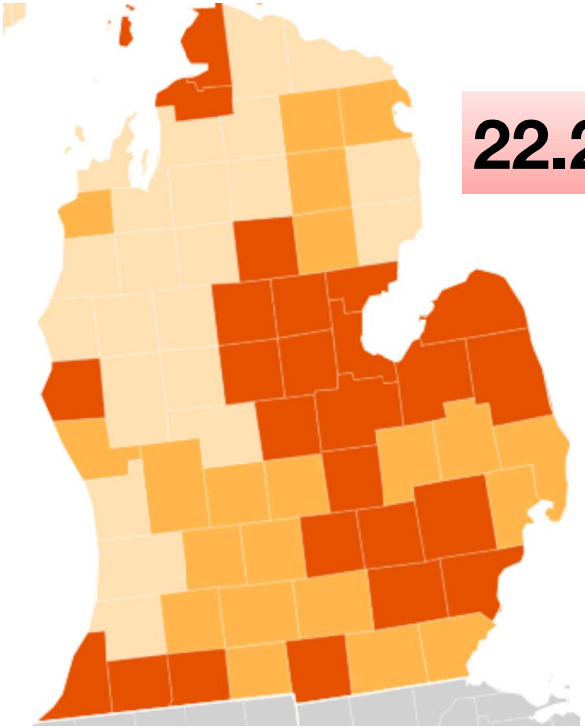
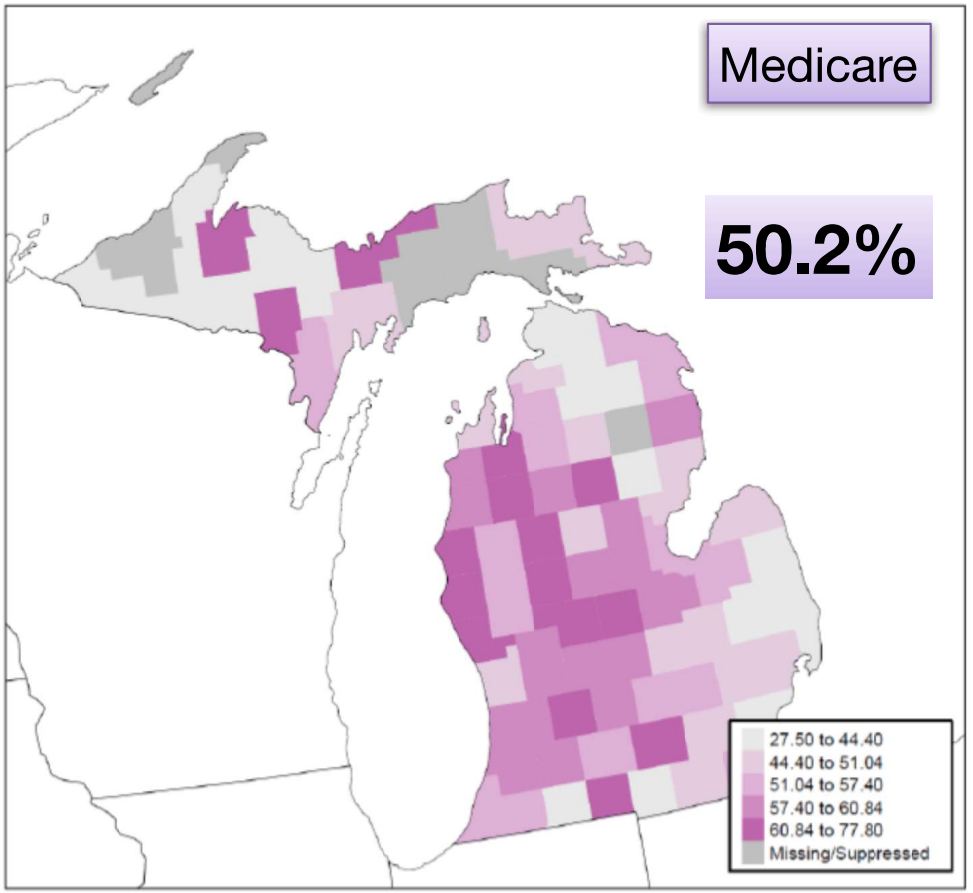
Percent Screening for CKD in Diabetes

Medicaid



22.2%

Medicare



50.2%

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Harrowing Facts

90% of those with CKD don't know they have it.

45% of those have CKD Stage 4.

Among Medicare patients, only 42% of those with diabetes were screened. For those with Systemic HTN only 6.8%.

90% of patients with diabetes and lab evidence of CKD will not have a CKD diagnosis in their chart.

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You can solve this.

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CKD Screening and Diagnosis

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CKD Screening

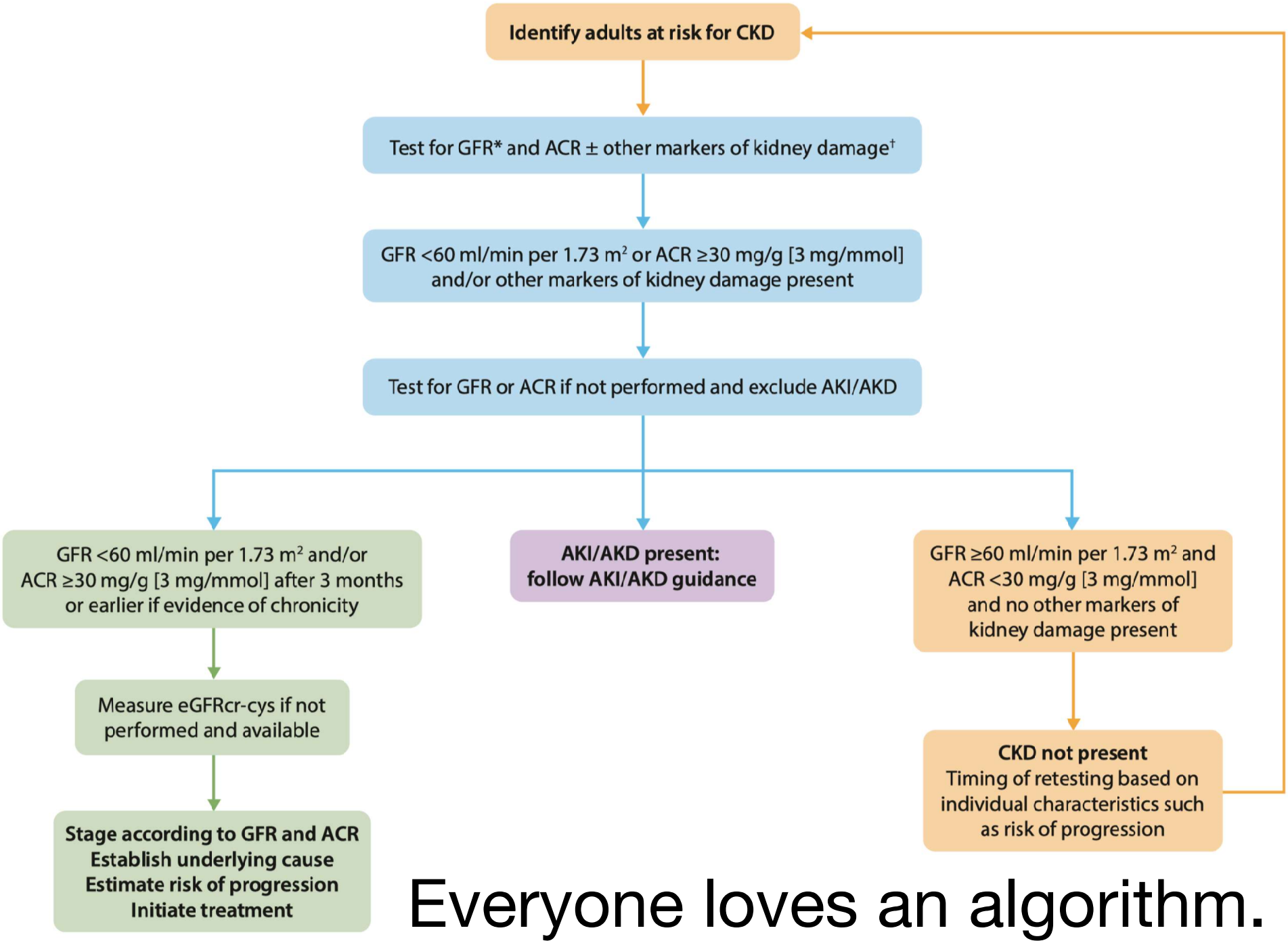
Universal screening for CKD in adults is not recommended – USPSTF, ACP

However, all individuals should be assessed for CKD risk as part of routine health examinations and if any risk factors are identified, it should trigger formal testing for CKD even in an asymptomatic adult

This is consistent with recommendations of the National Kidney Foundation Kidney Disease Outcomes Quality Initiative (NKF-KDOQI) guidelines for CKD, which have been reviewed and endorsed by the Kidney Disease: Improving Global Outcomes (KDIGO) 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease and the KDIGO 2019 Controversies Conference on early identification and intervention of CKD.

CKD Risk Factors

- **Modifiable**
  - **Diabetes**
  - **Hypertension**
  - Frequent NSAID use
  - Obesity
  - Smoking
- **Non-Modifiable**
  - Family history of kidney disease
  - Over 60 years old
  - Race/Ethnicity: African American, Hispanic, American Indian
  - History of Acute Kidney Injury (AKI)



Everyone loves an algorithm.

CKD Diagnosis

CKD is diagnosed using two laboratory tests

- Estimated glomerular filtration rate (eGFR) provides insight regarding overall kidney function
- Albumin-creatinine ratio, urine (ACR) provides insight regarding the extent of kidney damage

Some laboratories offer these two tests as a Kidney Profile to streamline the ordering process.

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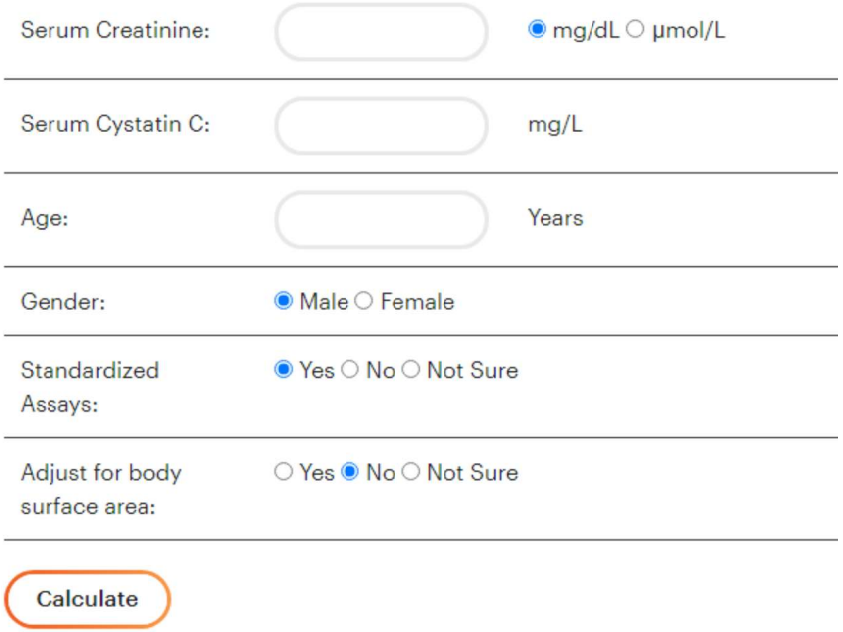
eGFR Calculation

- Normal eGFR varies according to age, sex and body size
- eGFR declines with age
- The NKF recommends the CKD-EPI Creatinine Equation (2021) to estimate eGFR without race variable
- NKF eGFR calculator: https://www.kidney.org/professionals/kdoqi/gfr_calculator



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Albumin-Creatinine Ratio, Urine

- Urine albumin-creatinine ratio (ACR) is calculated by dividing albumin concentration in milligrams by creatinine concentration in grams
- The urine creatinine assists in adjusting albumin levels of varying urine concentrations, which allows for more accurate results versus albumin alone
- New guidelines classify three levels of albuminuria as normal/mild, moderate or severe.
- Spot urine albumin-creatinine ratio for quantification of proteinuria. First morning void preferable – 24-hour urine test is rarely necessary to assess albuminuria or proteinuria

For more info:
https://www.kidney.org/sites/default/files/441-9047_2303_patflyer_albuminuria_final.pdf

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Albuminuria: Where there's smoke, there's Fire.

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Diagnostic Criteria for CKD

- Abnormalities of **kidney structure** or **function**, present for **> 3 months**, with implications for health
- Either of the following must be present for > 3 months:
  - eGFR: <60 mL/min/1.73m^2
  - Markers of kidney damage (one or more)
    - ACR >30 mg/g or AER >30mg/24hrs
    - Urine sediment abnormalities
    - Electrolyte and other abnormalities caused by tubular disorders
    - Histological abnormalities
    - Structural abnormalities detected through imaging
    - H/o kidney transplant

CKD Heat Map

CKD is classified based on:
- **Cause (C)**
- **GFR (G)**
- **Albuminuria (A)**

GFR categories (ml/min/1.73 m²) 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/mmol	≥300 mg/g ≥30 mg/mmol
	G1	Normal or high	≥90	Screen 1	Treat 1	Treat 3
	G2	Mildly decreased	60–89	Screen 1	Treat 1	Treat 3
	G3a	Mildly to moderately decreased	45–59	Treat 1	Treat 2	Treat 3
	G3b	Moderately to severely decreased	30–44	Treat 2	Treat 3	Treat 3
	G4	Severely decreased	15–29	Treat* 3	Treat* 3	Treat 4+
	G5	Kidney failure	<15	Treat 4+	Treat 4+	Treat 4+

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

Moderately increased risk

High risk

Very high risk

EGFR + UACR

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Case Study 1

A 55-year old obese man has a history of hypertension for which he takes a diuretic and ACE-inhibitor. He was hospitalized for acute kidney injury (AKI) in the setting of frequent ibuprofen use 6 months ago. His eGFR prior to his AKI was >90 ml/ min/1.73 m2 ; his prior ACR test revealed no albuminuria. However, his eGFR has now stabilized to 65 ml/min/1.73 m2 , and he has had persistent albuminuria of ~150 mg/g.

1) How should his CKD be classified?
2) What is his risk of progression?
3) How should he be monitored?

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

Moderately increased risk

High risk

Very high risk

Case Study 2

A 35-year old woman presents with type 1 diabetes, hypertension, and dyslipidemia. She is on an ACE-inhibitor with good blood pressure control. Within the past 3 years, her eGFR has dropped from 46 mL/min/1.73m2 to 28 mL/min/1.73 m2 . Her current albuminuria consistently remains ≥300 mg/g.

1) How should her CKD be classified?
2) What is her risk of progression?
3) How should she be monitored?

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CKD Heat Map

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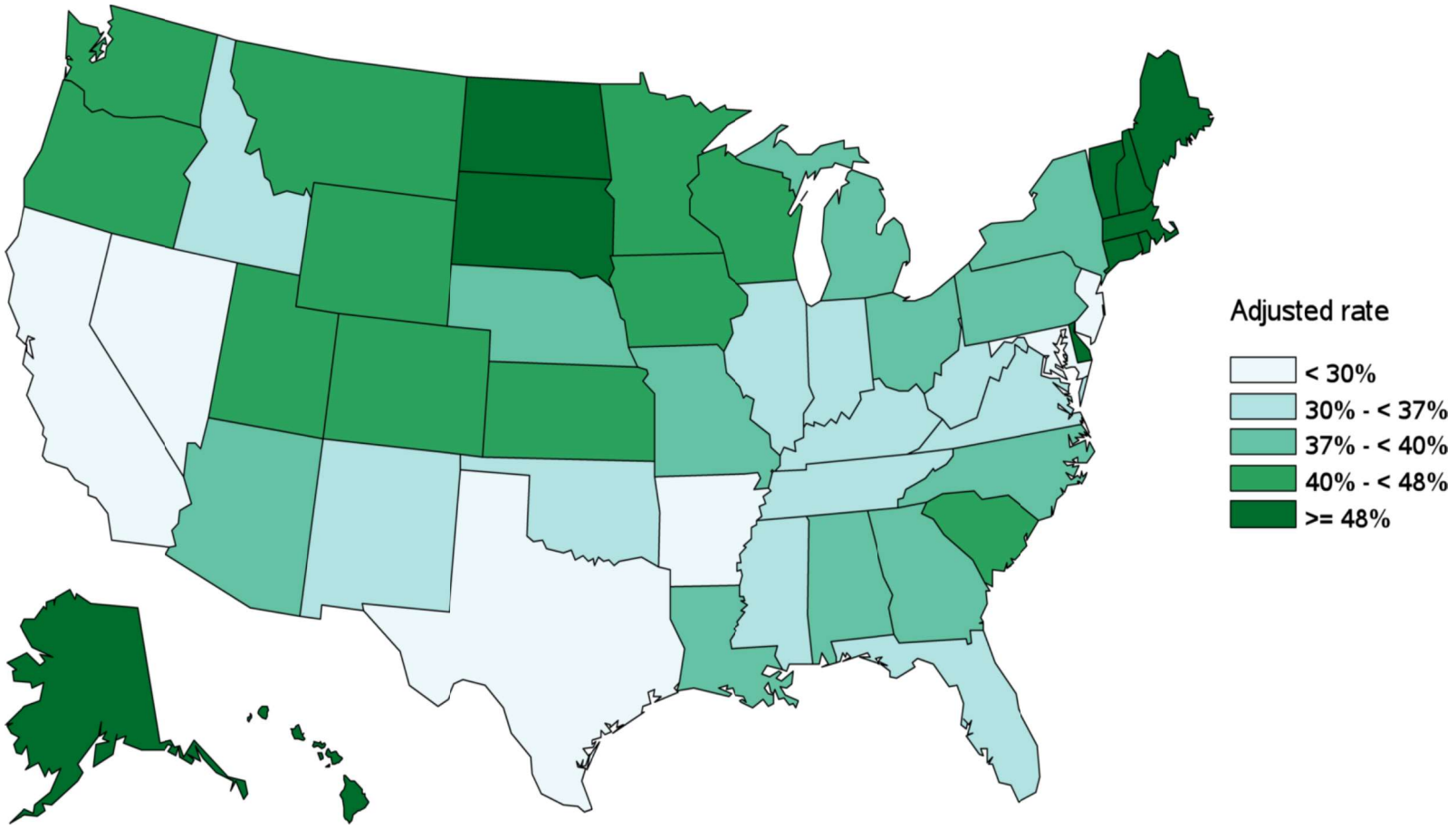
Low risk (if no other markers of kidney disease, no CKD)

Moderately increased risk

High risk

Very high risk

Nephrologist 12 mo prior to KRT



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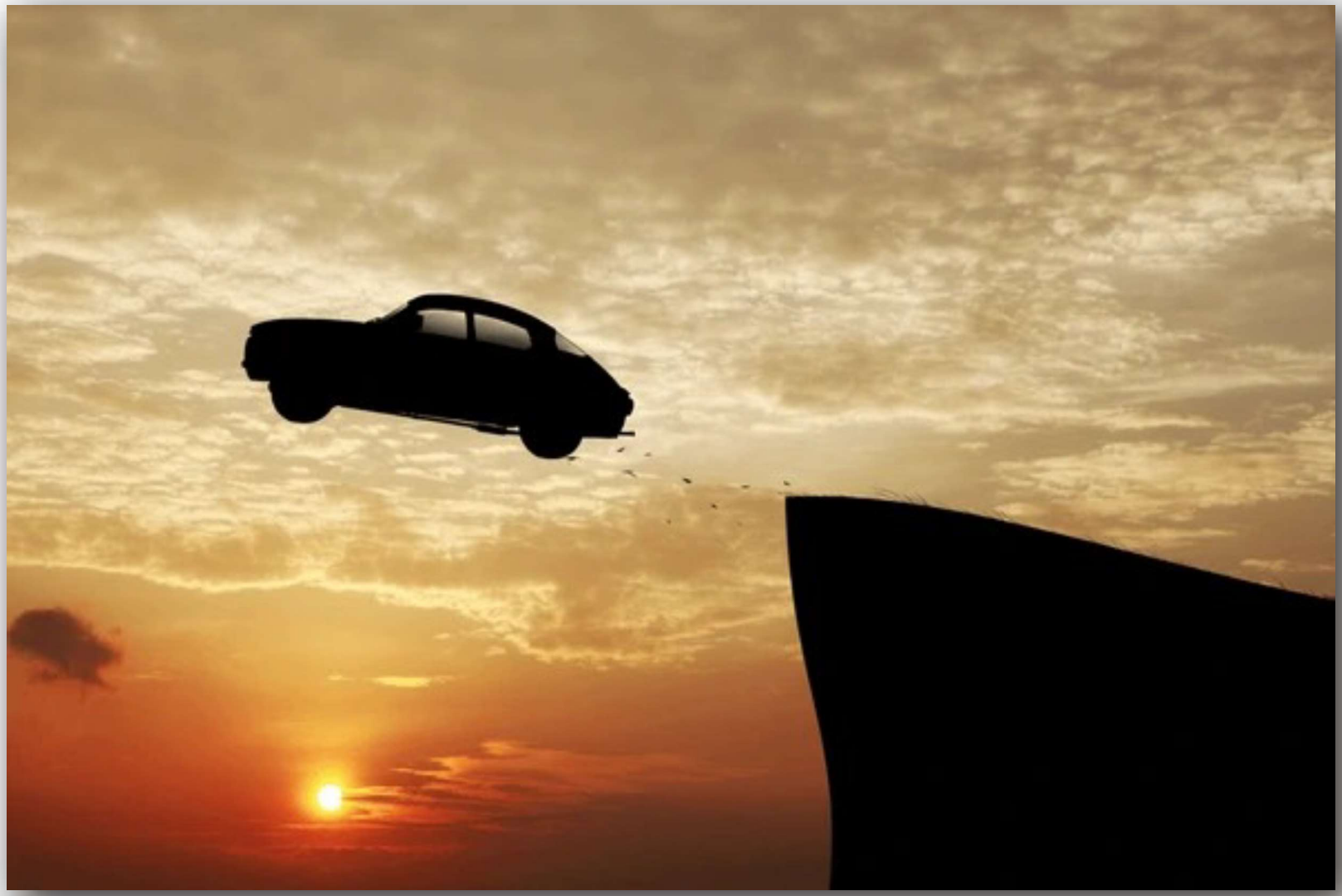

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HTN: The Silent (Kidney) Killer

- We suggest that adults with high BP and CKD be treated with a target systolic blood pressure (SBP) of <120 mm Hg, when tolerated, using standardized office BP measurement (2B).
- In adults with confirmed hypertension who are at increased risk for CVD, an SBP goal of at least <130 mm Hg, with encouragement to achieve SBP <120 mm Hg, is recommended to reduce the risk of cardiovascular events and total mortality (1A, 2B).

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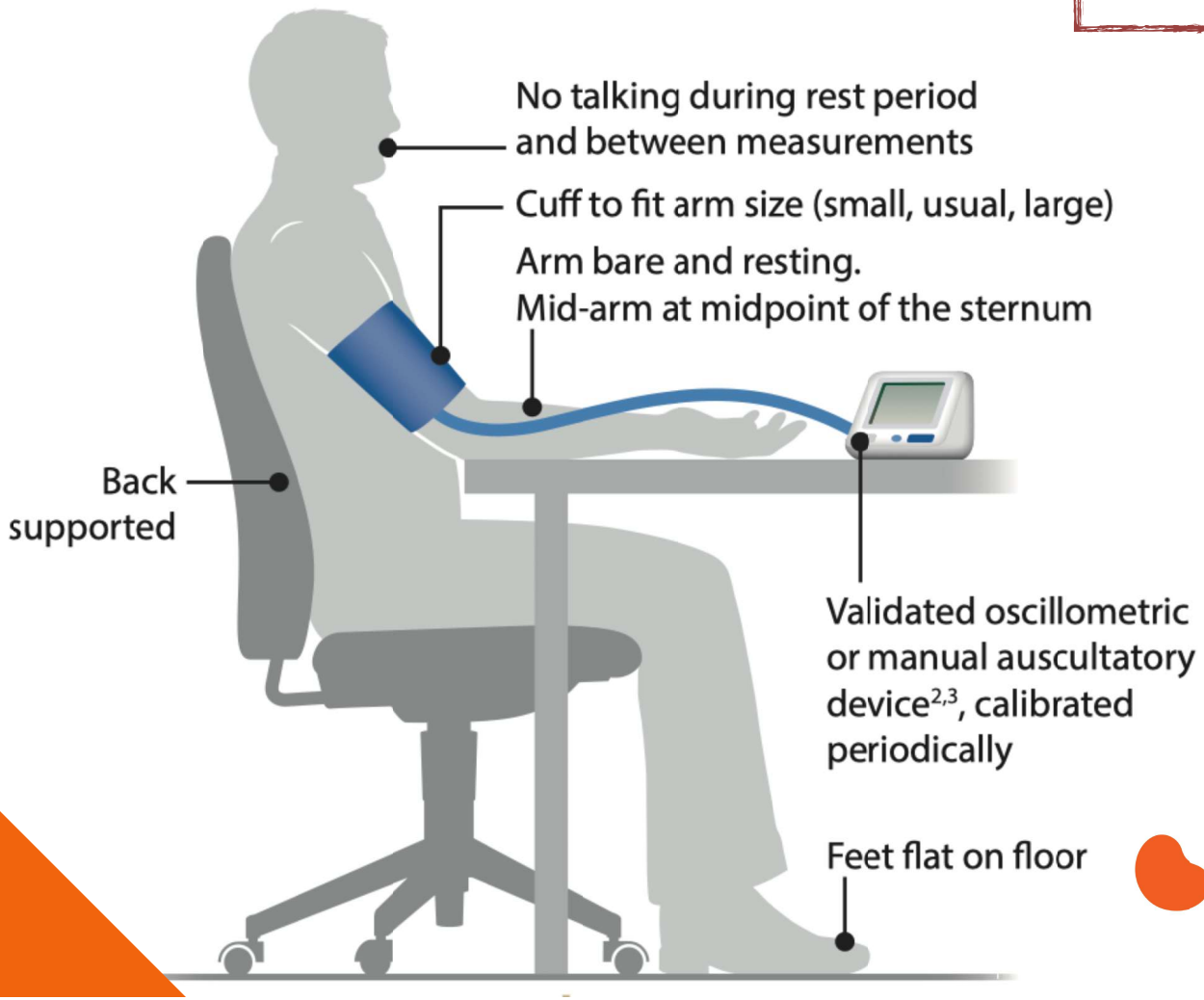
How to Measure

- Quiet room (no talking by patient or observer)
- No smoking, caffeine, or exercise for ≥30 min before measurement
- Empty bladder
- Relax for >5 min



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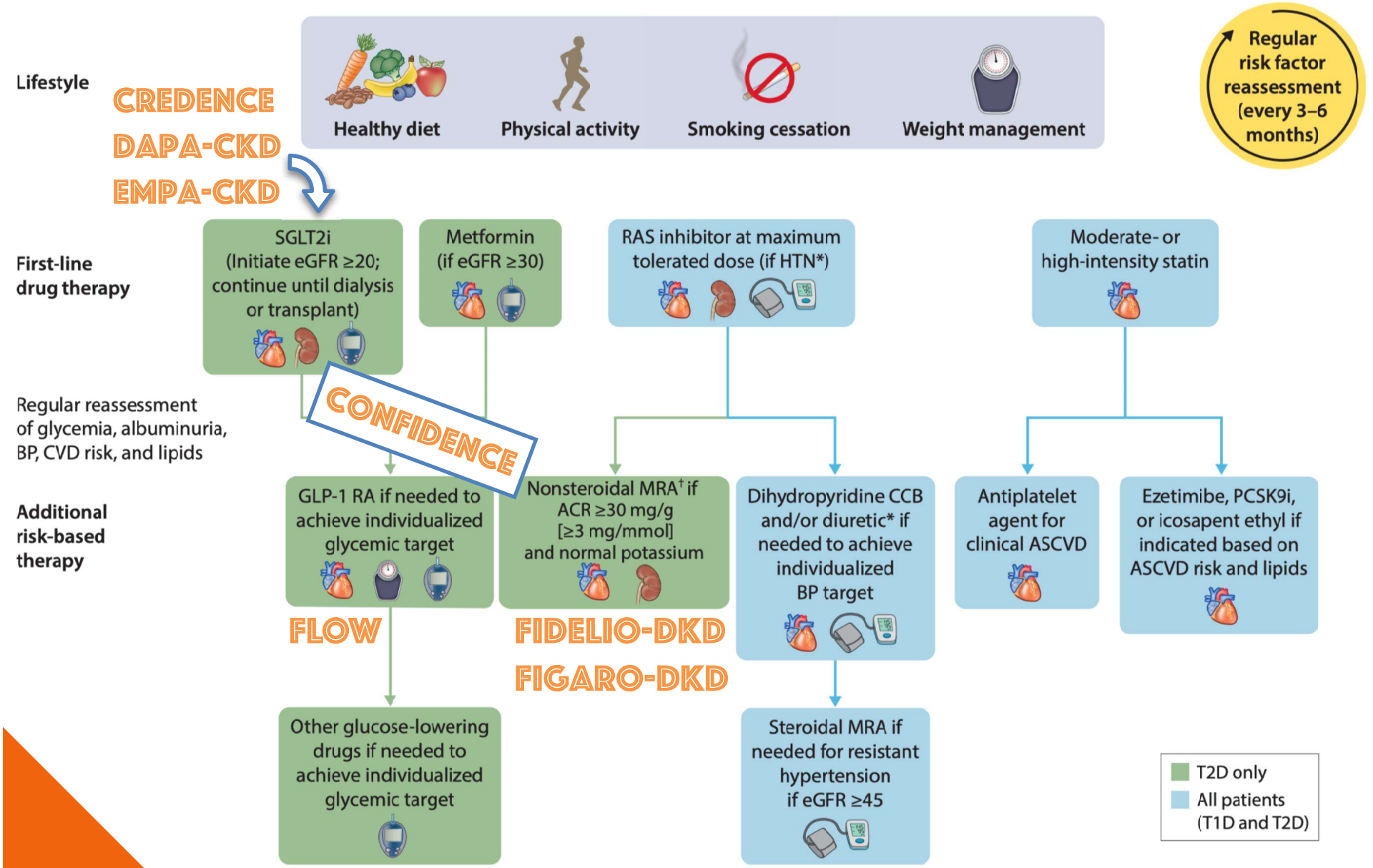

Diabetes in CKD

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CVD Risk Factor Modification → Slow Decline in Function

- **HTN:** office SBP <120, RAASi
- **DM:** SGLT2i, GLP-1a, finerenone, RAASi
- **Lipids:** Statin or statin/ezetimibe (>50, non-HD)
- **CVD:** GLP-1a, SGLT2i
- **Obesity:** TLC, GIP/GLP-1a

When should you refer?

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When should you refer?

Risk or Speed of progression is high

Cause of CKD is uncertain

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High Risk of Progression

- UACR >300 mg/gm (A3)
- Worsening of renal function discordant from comorbidity control
- High calculated risk

THE KIDNEY FAILURE RISK EQUATION

Find out your real risk of kidney failure

KIDNEY FAILURE

RISK CALCULATION

If you don't have the information required below talk to your doctor.

Age (Yrs)

Sex

Select

Region

Select

GFR (Ml/Min/1.73M2)

Urine Albumin: Creatinine Ratio

Units

Select

THE KIDNEY FAILURE RISK EQUATION

kidneyfailurerisk.com

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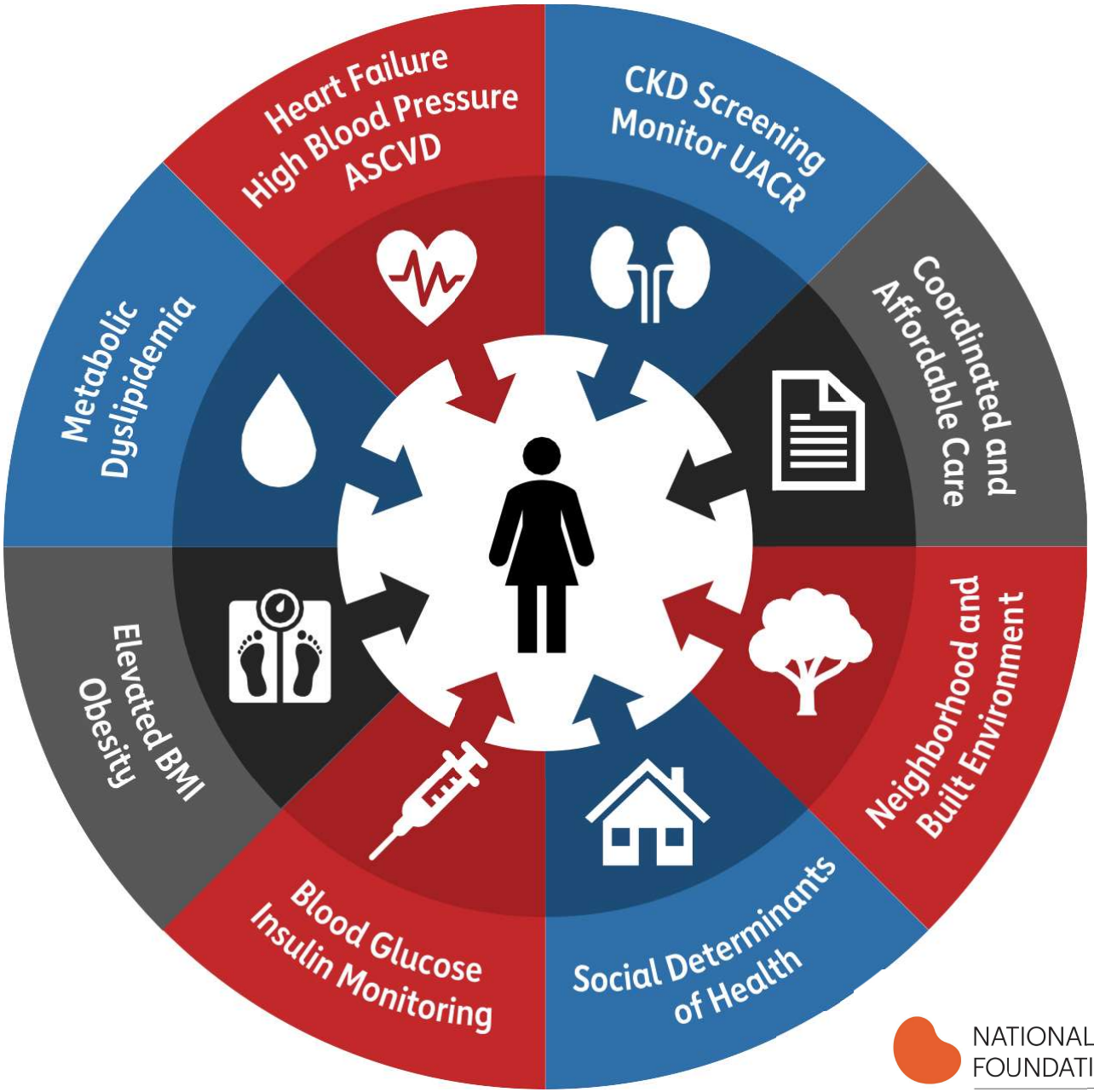

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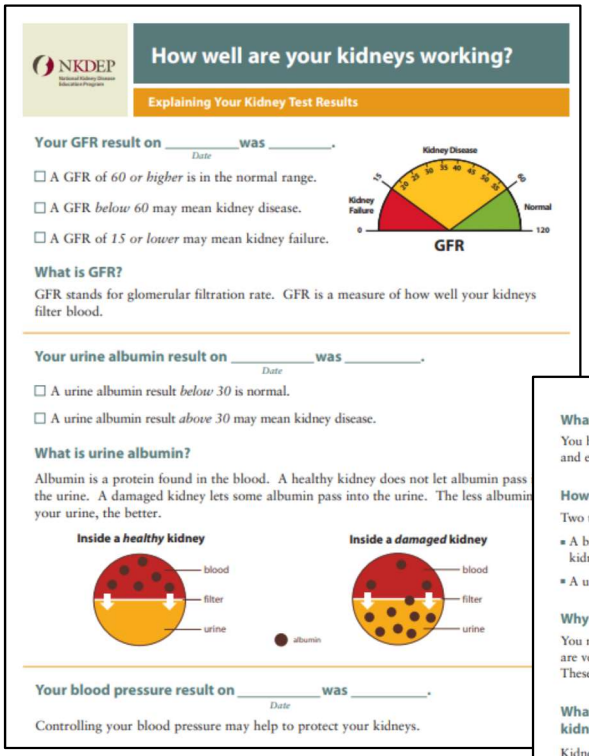
Patient Education on CKD tests



NKDEP

How well are your kidneys working?

Explaining Your Kidney Test Results

Your GFR result on _____ **was** _____.
Date

☐ A GFR of *60 or higher* is in the normal range.

☐ A GFR *below 60* may mean kidney disease.

☐ A GFR of *15 or lower* may mean kidney failure.

What is GFR?

GFR stands for glomerular filtration rate. GFR is a measure of how well your kidneys filter blood.

Your urine albumin result on _____ **was** _____.
Date

☐ A urine albumin result *below 30* is normal.

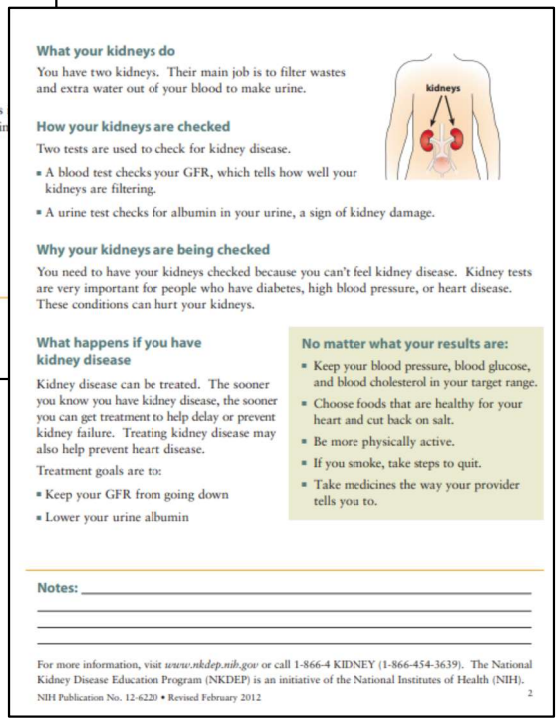
☐ A urine albumin result *above 30* may mean kidney disease.

What is urine albumin?

Albumin is a protein found in the blood. A healthy kidney does not let albumin pass the urine. A damaged kidney lets some albumin pass into the urine. The less albumin your urine, the better.

Your blood pressure result on _____ **was** _____.
Date

Controlling your blood pressure may help to protect your kidneys.



What your kidneys do

You have two kidneys. Their main job is to filter wastes and extra water out of your blood to make urine.

How your kidneys are checked

Two tests are used to check for kidney disease.

- A blood test checks your GFR, which tells how well your kidneys are filtering.
- A urine test checks for albumin in your urine, a sign of kidney damage.

Why your kidneys are being checked

You need to have your kidneys checked because you can't feel kidney disease. Kidney tests are very important for people who have diabetes, high blood pressure, or heart disease. These conditions can hurt your kidneys.

What happens if you have kidney disease

Kidney disease can be treated. The sooner you know you have kidney disease, the sooner you can get treatment to help delay or prevent kidney failure. Treating kidney disease may also help prevent heart disease.

Treatment goals are to:

- Keep your GFR from going down
- Lower your urine albumin

No matter what your results are:

- Keep your blood pressure, blood glucose, and blood cholesterol in your target range.
- Choose foods that are healthy for your heart and cut back on salt.
- Be more physically active.
- If you smoke, take steps to quit.
- Take medicines the way your provider tells you to.

Notes: _____

For more information, visit *www.nkdep.nih.gov* or call 1-866-4 KIDNEY (1-866-454-3639). The National Kidney Disease Education Program (NKDEP) is an initiative of the National Institutes of Health (NIH).

NIH Publication No. 12-6220 • Revised February 2012

2

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KIDNEY NUMBERS and the CKD HEAT MAP

EDUCATE YOUR PATIENTS

EXPLAIN
THE KIDNEY NUMBERS

Many people know their cholesterol and blood pressure numbers. But they also need to know their **kidney numbers**, to see if their kidneys are healthy or if they have **chronic kidney disease**, also called **CKD**. Having CKD means that you've had a kidney problem for at least 3 months.

Chronic kidney disease can creep up on you slowly and silently. You can be losing kidney function for many years without symptoms. Many people find out they have CKD only when their kidneys have failed and it's too late for preventive treatment. At this point, they usually need dialysis or a kidney transplant. That's why knowing your kidney numbers is so important!

There are two KIDNEY NUMBERS:

- **Estimated Glomerular Filtration Rate (eGFR)**, measured by a blood test.
- **Urine Albumin to Creatinine Ratio (uACR)**, measured by a urine test.

The **eGFR** shows how well your kidneys clean your blood, and the **uACR** shows if there's a protein called **albumin** in your urine, which may mean that your kidneys are damaged.

Along with your kidney numbers, your doctor reviews your health history and performs other tests to either confirm or rule out if you have CKD.

DESCRIBE
THE CKD HEAT MAP

If you do have chronic kidney disease, then your doctor will use the **CKD Heat Map** to find out your risk for CKD getting worse and your risk for heart disease.

On the left side of the map, your eGFR number matches up with a CKD stage. A higher eGFR number is better because it means you have a lower CKD stage.

eGFR Number	CKD Stage
90 or higher	G1
60-89	G2
45-59	G3a
30-44	G3b
15-29	G4
15 or lower	G5

On the top of the map, your uACR number matches up with a uACR level. A lower uACR is better because that means less albumin in the urine.

uACR Number	uACR Level
Lower than 30	A1, normal – mildly increased
30-300	A2, moderately increased
Higher than 300	A3, severely increased

www.nkfm.org/areyouthe33

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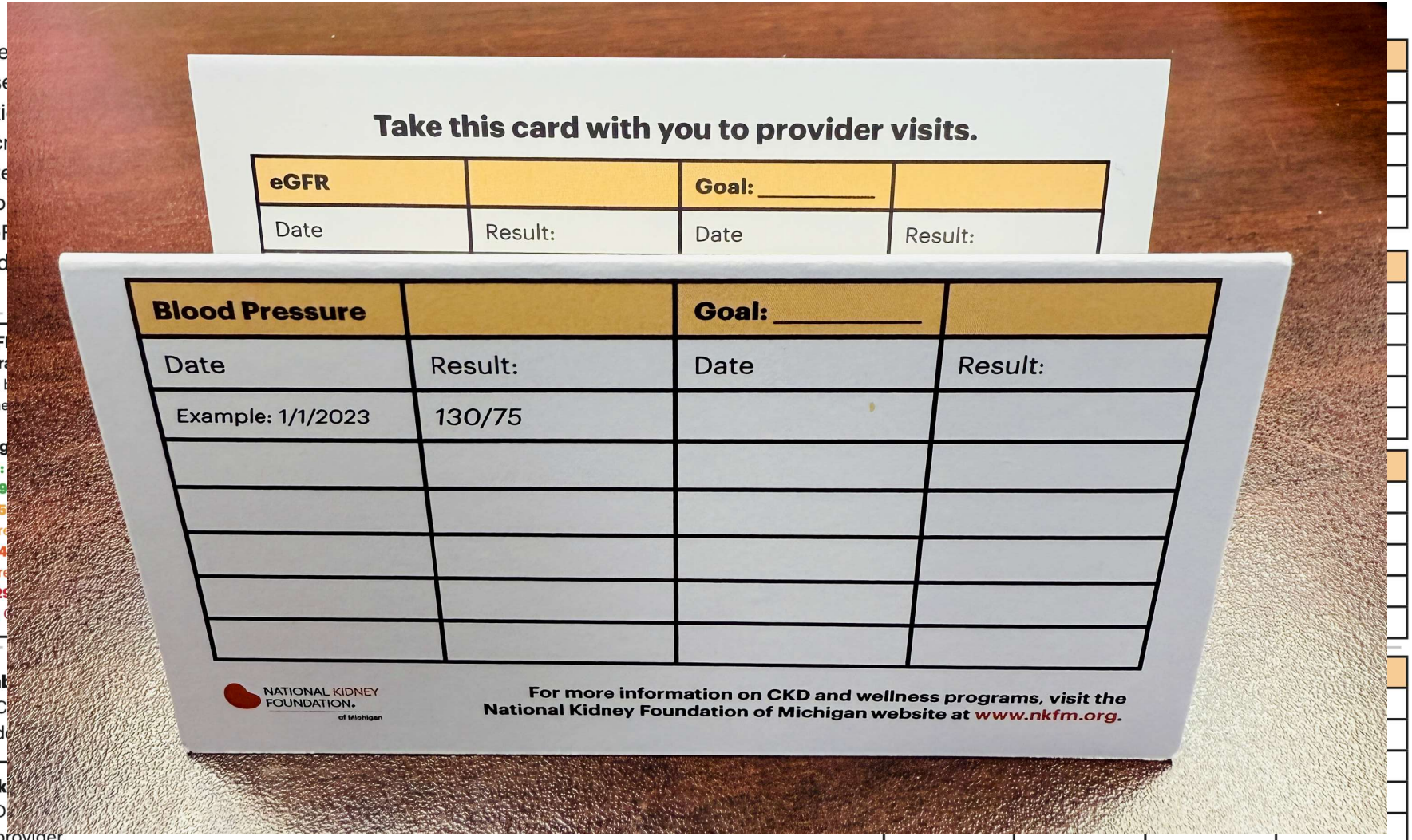
Patient Kidney Health Card



- Lifestyle changes: eat healthy foods, be active every day, avoid tobacco use, and avoid NSAIDs.
- Partnering with your doctor to come up with a plan that is right for you.

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For more information on CKD and wellness programs, visit the National Kidney Foundation of Michigan website at www.nkfm.org.

Key Points

- CKD is common, deadly and under-diagnosed
- Diabetes and Hypertension are the two leading causes of CKD
- CKD is detected with 2 tests: eGFR and uACR
- Classification of CKD allows you to identify an individual's risk level and develop a follow up plan.

How to help your community

- Identify people at risk & screen
- Patient level education on the silent but profound effect CKD can have if risk factors are not optimized
- Emphasize team approach and empower your patients to be at the center of that team

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Questions?

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Resources and Screening Guidelines

KDIGO Guidelines: Guidelines – KDIGO

NKF KDOQI Clinical Practice Guidelines:

NKF KDOQI clinical practice guidelines | National Kidney Foundation

Standards of Care in Diabetes 2024: Volume 47 Issue Supplement_1 | Diabetes Care | American Diabetes Association (diabetesjournals.org)

NKF Chronic Kidney Disease Change Package: Chronic Kidney Disease Change Package | National Kidney Foundation

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