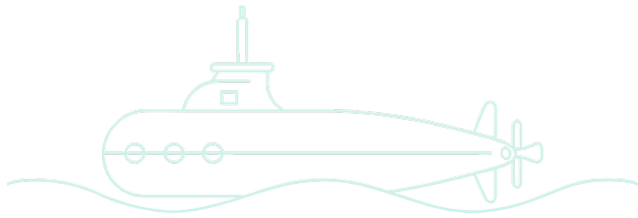
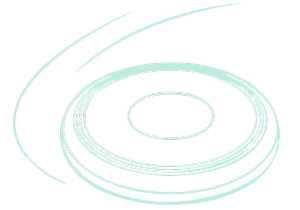


WELCOME!



Community Health Center Association of Connecticut

**To claim CMEs for this session
please scan the QR code to log
attendance and complete the
required survey.**





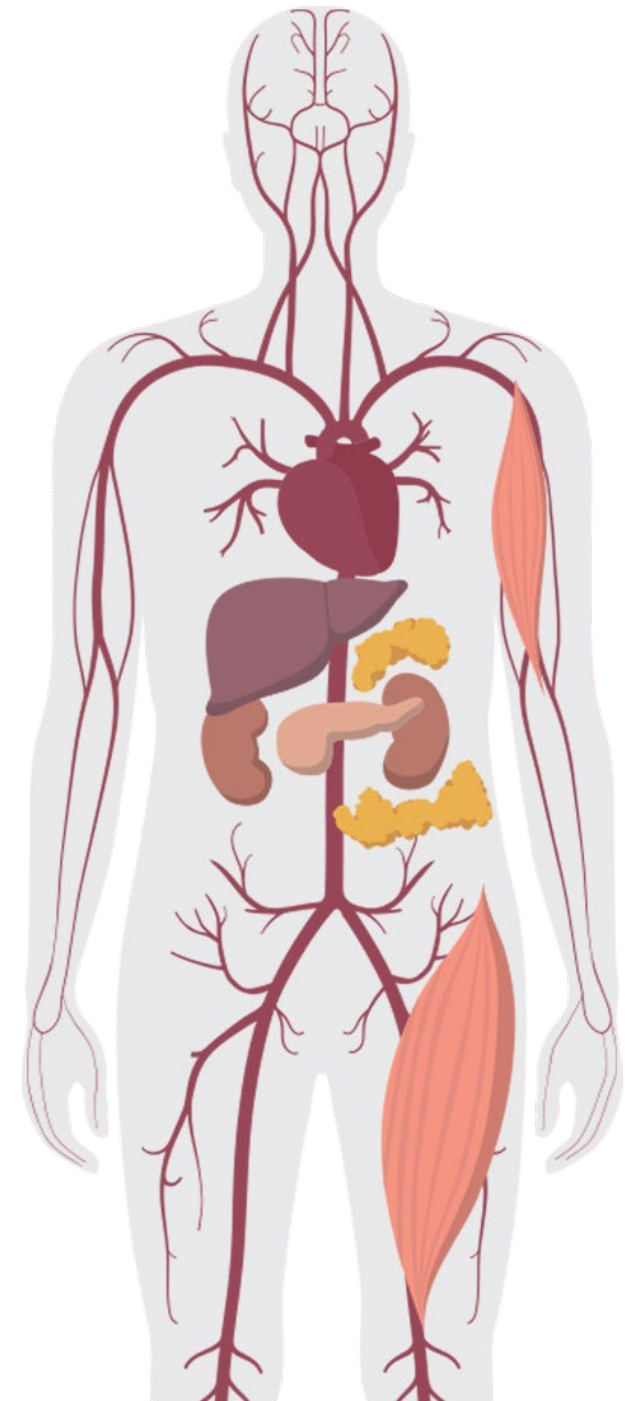
Kenneth French
Director, Clinical Consultant
Quest Diagnostics



Addressing the Most Common and Costly Cardiometabolic Conditions to Improve Metrics and Patient Care

Kenneth French

Director, Clinical Consultant, Quest Cardiometabolic Center of Excellence at Cleveland HeartLab



Diagnosics insights across the cardiometabolic continuum



Cardiometabolic

Prevention, diagnosis, and management of heart disease and related conditions

- **Unique diagnostic approach** aligns with thought leaders at key **industry** organizations
- Interconnected, not siloed, approach focused on the **whole patient**
- **Abnormal hormone levels** are related to physiological and metabolic dysfunction affecting cardiometabolic health
- Help healthcare providers **risk-stratify their high-risk** patients

Cardiovascular disease

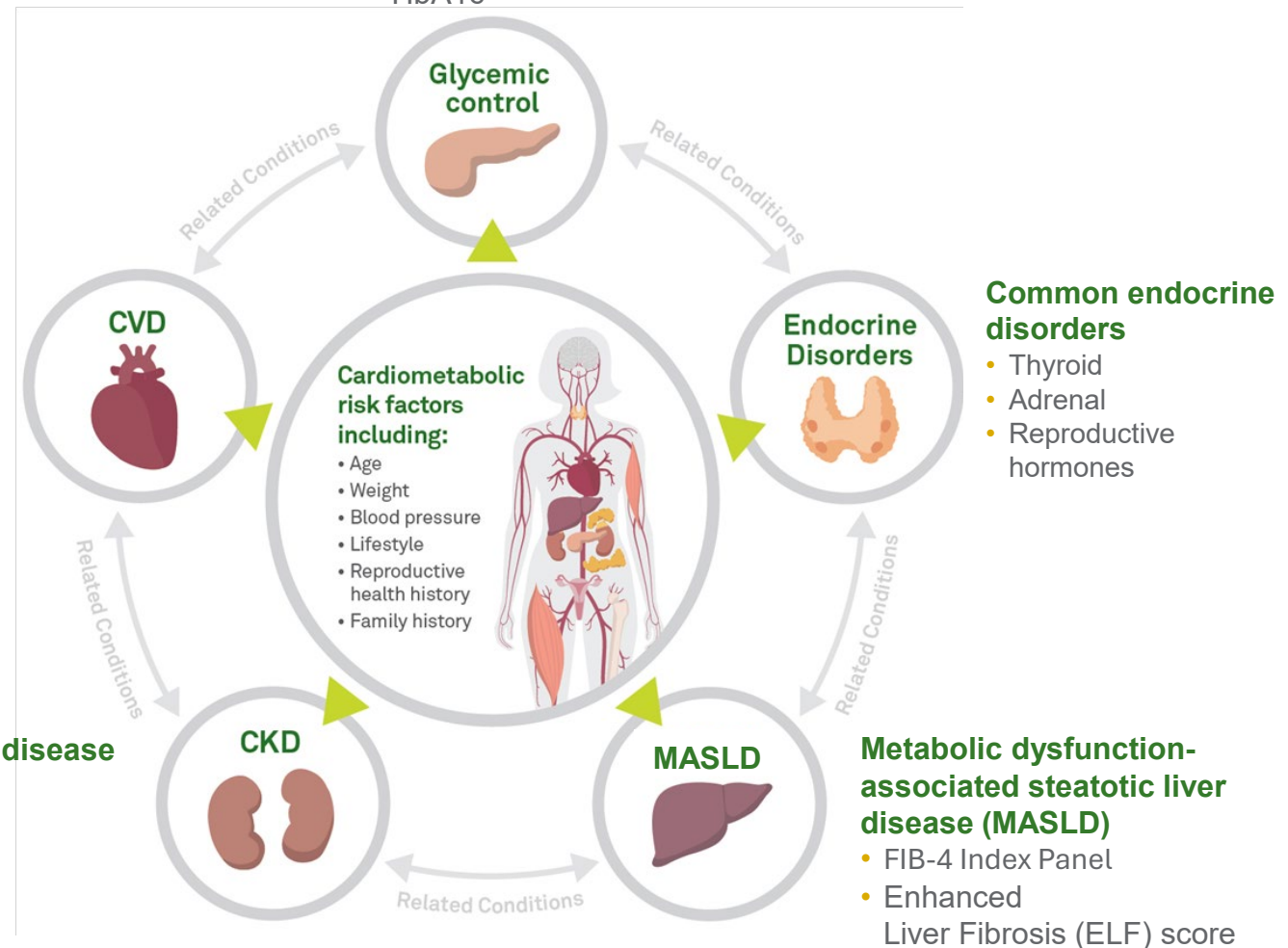
- Advanced lipids
- Inflammation
- Heart failure

Chronic kidney disease

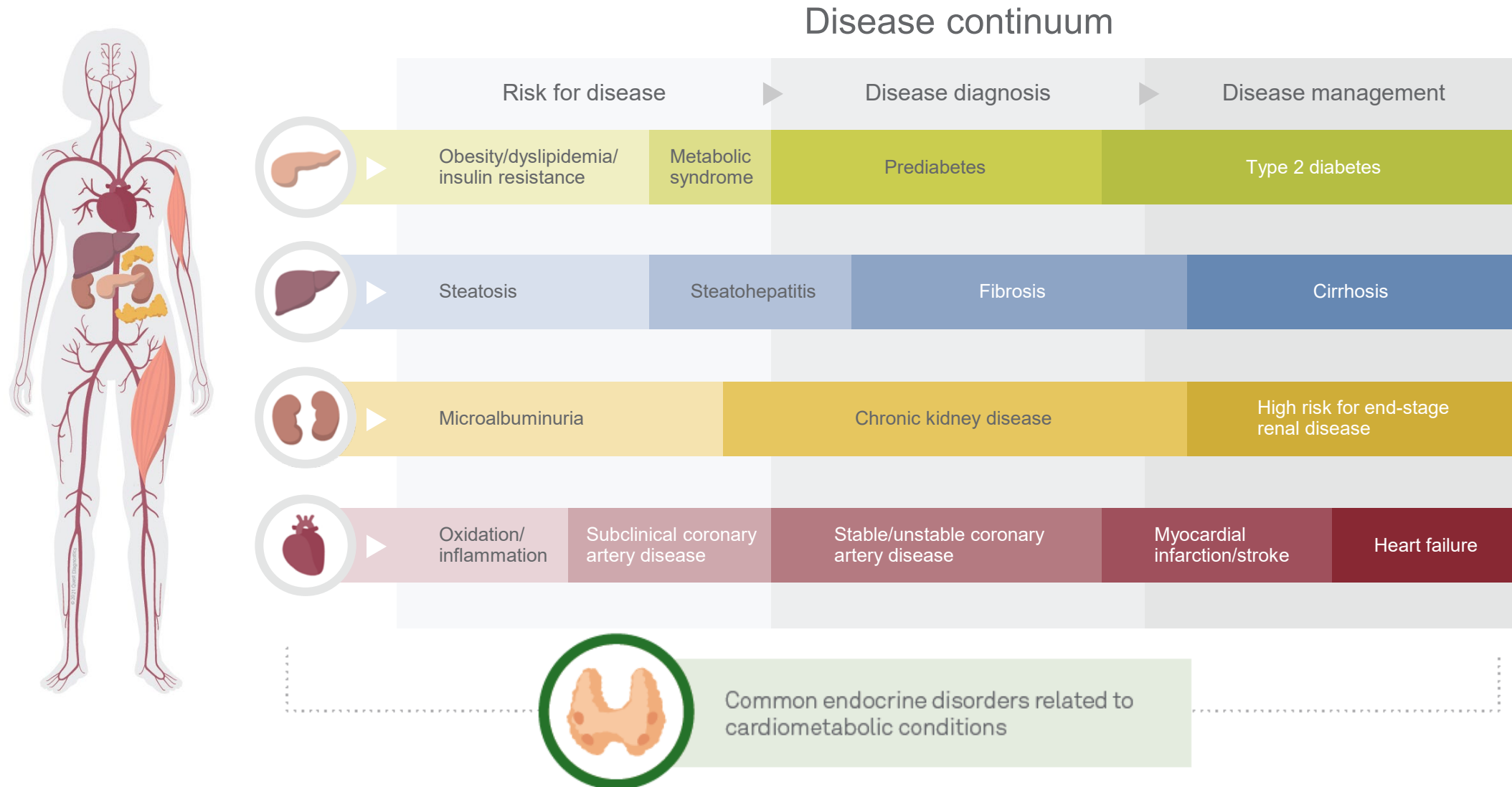
- Kidney Profile
- Cystatin C

Glycemic control

- Fasting blood glucose
- Insulin resistance
- HbA1c



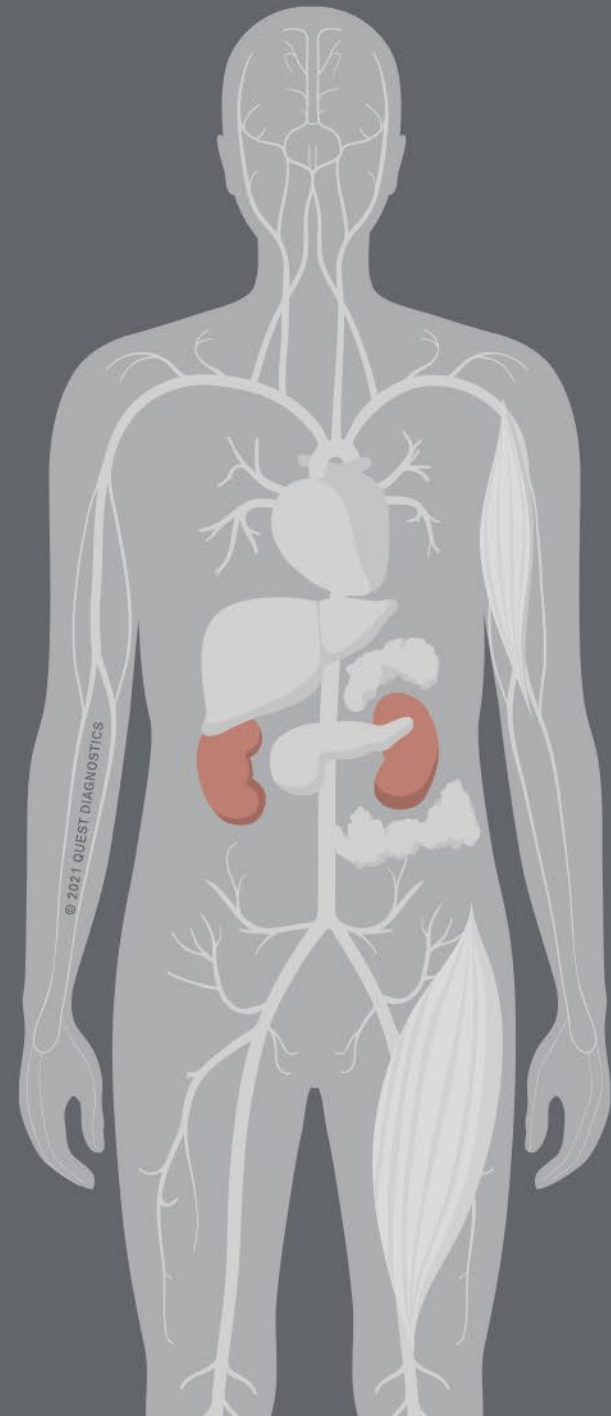
Improve clinical outcomes through early identification, accurate diagnosis, and intervention



3 areas of focus

- Review National Kidney Foundation recommendations for identifying patients who are at a high risk for chronic kidney disease
- Discuss methodology to identify primary aldosteronism, a condition affecting up to a third of all patients with hypertension and posing serious risk to the cardiovascular, hepatic, and renal systems
- Review risk assessment identification for the fastest-growing organ disease in the US: metabolic dysfunction-associated steatotic liver disease (MASLD)

Chronic Kidney Disease



Chronic kidney disease: scope of the problem (30 yrs .. no change)



80 million
are at risk for chronic kidney
disease (CKD)¹

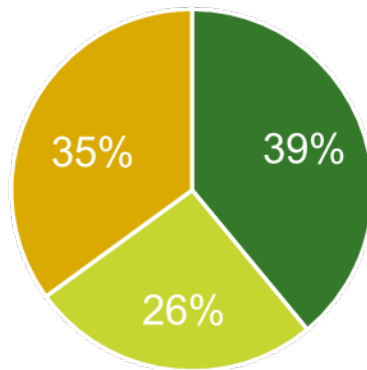


37 million
are afflicted with CKD¹



Nearly 40%
of those with stage 4 CKD
remain **unaware of their
diagnosis**²

Causes of kidney disease in the United States



■ Diabetes ■ Hypertension ■ Other or unknown cause

Factors underlying the increase in CKD

- Increasing prevalence of **type 2 diabetes mellitus (T2DM)** and **hypertension** (45% in 2018, up from 42% in 2013³); upward trends in obesity and cardiovascular disease (CVD)
- Despite efforts to raise awareness and reduce CKD progression, the prevalence of CKD stages 1-4 increased from 11.8% to **14.2%** over the past 25 years⁴
- Screening is crucial, as 9 in 10 adults with CKD don't know they have it, causing late-stage diagnosis⁵ and 1 in 4 patients to "crash" into dialysis⁶

1. Centers for Disease Control and Prevention. *Chronic Kidney Disease in the United States, 2019*. US Department of Health and Human Services; 2019. 2. United States Renal Data System. 2020 Annual Data Report. Accessed February 1, 2022. <https://adr.usrds.org/2020/chronic-kidney-disease/1-ckd-in-the-general-population> 3. Ostchega Y, et al. NCHS Data Brief, no. 364. 2020. 4. Centers for Disease Control and Prevention. Chronic Kidney Disease Surveillance System—United States. <http://www.cdc.gov/ckd> 5. Centers for Disease Control and Prevention. *Chronic Kidney Disease in the United States, 2021*. US Department of Health and Human Services. 6. Hassan R, et al. *Can J Kidney Health Dis*. 2019;6:2054358119831684. doi: 10.1177/2054358119831684

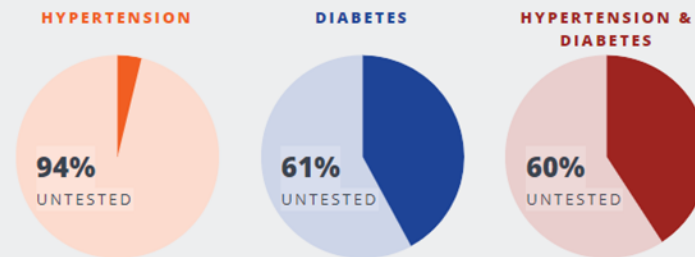
Medical organizations are urging a focus on CKD



Medical and healthcare quality organizations are implementing programs to address **low rates of testing for CKD**

National Kidney Foundation Laboratory Engagement Plan ^{1,2}

LOW RATES OF ALBUMIN-CREATININE RATIO TESTING FOR CKD



Hypertension and diabetes are the top two risk factors for developing CKD, but many people with these conditions are not receiving recommended testing.

The NKF is partnering with major laboratories to bridge the gap in testing for CKD.

National Committee for Quality Assurance HEDIS® Measure ³

Kidney Health Evaluation for Patients with Diabetes (KED)

HEDIS® Measurement Year 2020 & 2021 Measures

Measure Description: The percentage of members 18–85 years of age with diabetes (type 1 and type 2) who received a kidney health evaluation, defined by an estimated glomerular filtration rate (eGFR) **and** a urine albumin-creatinine ratio (uACR), during the measurement year:

- At least one eGFR is required during the measurement period
- At least one uACR is required during the measurement period
- The uACR is identified by the member having **both** a quantitative urine albumin test **and** a urine creatinine test **with** service dates four or less days apart
- Care must be captured administratively for the KED Measure. Medical record submission will not count.

Health plans are now assessed on the percent of diabetic patients that receive annual CKD testing.

1. National Kidney Foundation. Laboratory Medicine Impact on Population Health Implementing the Kidney Profile. https://www.kidney.org/sites/default/files/02-11-8160_hbj_cmo_ascp_poster3.pdf.

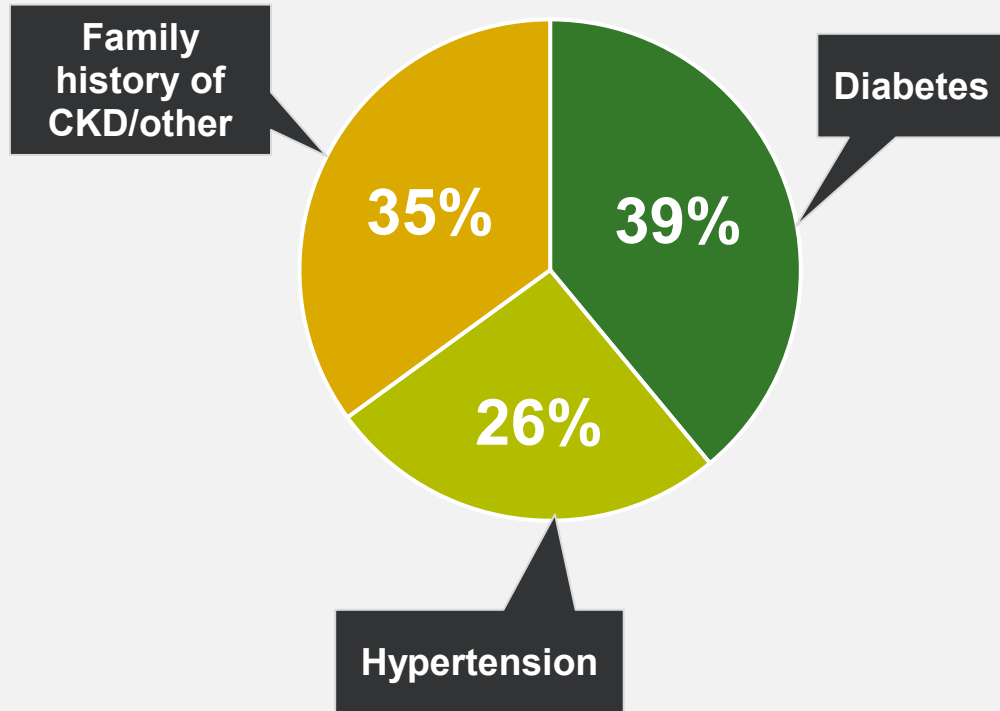
2. National Kidney Foundation. CKDIntercept Laboratory Engagement Initiative. <https://www.kidney.org/CKDintercept/laboratoryengagement>.

3. Aetna. Kidney Health Evaluation for Patients with Diabetes (KED). https://www.aetnabetterhealth.com/pennsylvania/assets/pdf/provider/quality/2020_2021%20Kidney%20Health%20Evaluation%20KED.pdf.

CKD guidelines released in March 2024

The latest evolution in chronic kidney disease management involves increased responsibility by PCPs

Causes of kidney disease



The Gap in Testing

- Of the patients with hypertension and diabetes
 - **55% not tested correctly**
- Of the patients with diabetes only
 - **52% not tested correctly**
- Of the patients with hypertension only
 - **87% not tested correctly**

Which tests do NKF guidelines recommend?

Guidelines recommend

2 tests

to assess CKD risk:
estimated glomerular
filtration rate (eGFR)
and urine albumin-
creatinine ratio (uACR)¹



eGFR test

→ defines kidney function

Already accepted and
used frequently, but this
test alone may not be enough



uACR test

→ defines kidney damage

The missing piece that is
needed to comprehensively
manage patients

1. National Kidney Foundation. Quick reference guide on kidney disease screening. Accessed November 12, 2020. https://www.kidney.org/kidneydisease/siemens_hcp_quickreference#

CKD and 10 common complications

Age <65	ACR, mg/g				ACR, mg/g			
	eGFRcr-cys <10	10-29	30-299	300+	<10	10-29	30-299	300+
	All-cause mortality				Myocardial infarction			
105+	0.99	1.2	1.5	2.4	0.93	1.0	1.1	2.6
90-104	ref	1.3	1.5	2.5	ref	1.2	1.3	1.9
60-89	1.2	1.6	2.0	2.9	1.3	1.4	1.6	2.1
45-59	2.1	2.7	2.9	4.5	1.8	2.6	3.1	3.5
30-44	2.7	3.8	4.2	5.6	1.9	2.3	3.0	3.9
<30	5.2	4.0	7.1	8.6	4.1	3.6	4.7	5.8
	Cardiovascular mortality				Stroke			
105+	0.95	1.4	1.7	4	0.96	1.2	1.6	2.7
90-104	ref	1.6	1.8	3.5	ref	1.2	1.5	2.2
60-89	1.3	1.7	2.3	3.9	1.2	1.4	1.7	2.6
45-59	2.5	4.0	4.6	6.0	1.9	2.0	2.5	3.8
30-44	3.1	6.6	5.3	7.1	2.6	3.7	3.5	3.5
<30	6.0	5.5	9.4	12	2.6	2.9	5.1	5.1
	Kidney failure replacement therapy				Heart failure			
105+	0.57	0.77	2.3	12	0.86	1.1	1.7	3.4
90-104	ref	1.4	3.9	11	ref	1.5	1.5	3.0
60-89	1.9	3.7	8.3	33	1.2	1.7	2.1	3.6
45-59	7.0	16	28	100	1.7	3.3	3.4	5.3
30-44	22	34	109	210	3.5	4.3	6.8	5.7
<30	335	267	419	625	7.5	6.3	9.7	8.9

Age <65	ACR, mg/g				ACR, mg/g			
	eGFRcr-cys <10	10-29	30-299	300+	<10	10-29	30-299	300+
	Acute kidney injury				Atrial fibrillation			
105+	0.75	1.0	1.4	3.4	0.93	1.0	1.3	1.9
90-104	ref	1.2	1.8	2.6	ref	1.2	1.4	2.3
60-89	1.6	2.7	2.9	5.8	1.1	1.3	1.5	1.8
45-59	4.2	6.0	5.6	7.6	1.5	2.0	2.1	2.6
30-44	5.7	9.4	9.8	9.4	1.8	2.4	3.0	2.8
<30	15	14	14	13	3.7	2.9	4.3	5.4
	Hospitalization				Peripheral artery disease			
105+	1.0	1.1	1.1	1.5	0.93	1.9	1.5	2.6
90-104	ref	1.1	1.2	1.3	ref	1.6	2.1	3.9
60-89	1.1	1.2	1.3	1.6	1.2	2.1	2.2	5.4
45-59	1.3	1.7	1.5	2.0	3.2	7.3	3.4	8.4
30-44	1.5	1.8	1.6	2.1	6.5	9.1	6.6	13
<30	2.1	2.4	2.4	3.5	1.4	7.6	18	16

Associations of chronic kidney disease (CKD) staging by estimated glomerular filtration rate by creatinine and cystatin C (eGFRcr-cys) and albumin-to-creatinine ratio (ACR) categories and risks for 10 common complications by age in multivariable-adjusted analyses.

U.S. Preventive Services TASKFORCE (USPSTF)

Chronic Kidney Disease: Screening (In Progress)

- In asymptomatic adults without known chronic kidney disease (CKD),* what are the effects of screening for CKD vs. no screening on clinical outcomes?
- What are the harms of screening for CKD vs. no screening?
- What is the diagnostic accuracy of screening to identify adults with CKD stages 1–3?
 - How does diagnostic accuracy vary in populations defined by race, ethnicity, age, and sex?
- Among adults with CKD stages 1–3,† what are the effects of monitoring for worsening kidney function, kidney damage, or both vs. no monitoring on clinical outcomes?
- Among adults with CKD stages 1–3,† what are the harms of monitoring for worsening kidney function, kidney damage, or both vs. no monitoring?
- Among adults with CKD stages 1–3,† what are the effects of treatment on likelihood of developing stage 4 or 5 CKD?
- Among adults with CKD stages 1–3,† what are the effects of treatment on clinical outcomes?
- Among adults with CKD stages 1–3,† what are the effects of treatment on harms?
- *For screening, studies in which patients were selected on the basis of having conditions associated with CKD (e.g., hypertension, diabetes) are not eligible for inclusion. However, studies are not required to exclude patients with these conditions.
- †For treatment, studies will not be restricted according to whether patients have screen- or non-screen-detected CKD, or whether patients are eligible for evaluated treatments for reasons other than CKD (e.g., presence of diabetes mellitus, hypertension, or dyslipidemia).

New KDIGO Recommendations 2024

CKD is classified based on: • Cause (C) • GFR (G) • Albuminuria (A)				Albuminuria categories		
				Description and range		
				A1	A2	A3
				Normal to mildly increased <30 mg/g <3 mg/mmol	Moderately increased 30–299 mg/g 3–29 mg/mmol	Severely increased ≥300 mg/g ≥30 mg/mmol
GFR categories (ml/min/1.73 m ²) Description and range	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)	■ High risk
■ Moderately increased risk	■ Very high risk






Figure 13 | Frequency of monitoring glomerular filtration rate (GFR) and albuminuria in people with chronic kidney disease (CKD). Albuminuria and GFR grid reflects the risk of progression by intensity of coloring (green, yellow, orange, red, and deep red). The numbers in the boxes are a guide to the frequency of monitoring (number of times per year). Reproduced from de Boer IH, Khunti K, Sadusky T, et al. Diabetes management in chronic kidney disease: a consensus report by the American Diabetes Association (ADA) and Kidney Disease: Improving Global Outcomes (KDIGO). *Kidney Int.* 2022;102:974–989.²⁹ Copyright © 2022, International Society of Nephrology, American Diabetes Association, and KDIGO. Published by Elsevier Inc. and American Diabetes Association. All rights reserved.

When combined, eGFR and uACR offers powerful insights

The National Kidney Foundation (NKF) has published clear guidelines on how to use eGFR and uACR to guide management and follow-on testing

Easy-to-Interpret Risk Map

			Albuminuria Categories and ACR Ranges (mg/g creatinine)		
			Normal	Moderately Increased	Severely Increased
			<30	30-299	≥300
CKD Stage and eGFR Range (mL/min/1.73 m ²)	1 and 2	≥60	1	1	2,R
	3A	45-59	1,C	2	3,R
	3B	30-44	2	3	3,R
	4	15-29	3,R	3,R	≥4,R
	5	<15	≥4,R	≥4,R	≥4,R

	Low risk: monitor yearly if evidence of kidney damage (eg, indicated by imaging or biopsy).
	Moderately high risk: monitor yearly
	High risk: monitor 2 times yearly
	Very high risk: monitor 3 times yearly
	Very high risk: monitor ≥4 times yearly

- C: Confirm using eGFR based on (1) cystatin C (test code 94588) or (2) creatinine plus cystatin C
- R: refer to specialist

Clear Guidance on Follow-on Testing

eGFR ≥ 60	eGFR 45 - 59	eGFR 30 - 44	eGFR ≤ 29
If uACR > 30 mg/g: <ul style="list-style-type: none"> ▪ ASCVD Risk Panel with Score Annually ▪ Hemoglobin A1c as Needed to Monitor Glycemic Control 	<ul style="list-style-type: none"> ▪ Hemoglobin A1c as Needed to Monitor Glycemic Control ▪ Carbon Dioxide At Least Once If uACR > 30 mg/g: <ul style="list-style-type: none"> ▪ Serum Potassium Annually 	<ul style="list-style-type: none"> ▪ Hemoglobin A1c as Needed to Monitor Glycemic Control ▪ Carbon Dioxide At Least Once ▪ PTH At Least Once ▪ Phosphate At Least Once If uACR > 30 mg/g: <ul style="list-style-type: none"> ▪ Serum Potassium Annually 	<ul style="list-style-type: none"> ▪ Hemoglobin A1c as Needed to Monitor Glycemic Control ▪ Carbon Dioxide At Least Once ▪ PTH At Least Once ▪ Phosphate At Least Once If uACR > 30 mg/g: <ul style="list-style-type: none"> ▪ Serum Potassium Annually On Warfarin Therapy: <ul style="list-style-type: none"> ▪ Prothrombin Time with INR Annually

Enhanced report

Summary of results and next steps including referral to nephrologist

Lab: Z99

Kidney Profile

Summary:
 Patient's results are prognostic of Stage 3A Chronic Kidney Disease. There were no historical eGFR values found for this patient. KDIGO guidelines recommend additional tests (such as Cystatin C or a clearance measurement) to confirm eGFR measurement. KDIGO guidelines do not recommend referral to a nephrologist at this time.

KDIGO and the National Kidney Foundation provide the following evidence-based suggestions for testing for complications and comorbidities

CKD Stage 1 - 2	CKD Stage 3A	CKD Stage 3B	CKD Stage 4 - 5
If uACR > 30 mg/g: • ASCVD Risk Panel with Score Annually • Hemoglobin A1c as Needed to Monitor Glycemic Control	Hemoglobin A1c as Needed to Monitor Glycemic Control Carbon Dioxide At Least Once If uACR > 30 mg/g: Serum Potassium Annually	Hemoglobin A1c as Needed to Monitor Glycemic Control • Carbon Dioxide At Least Once • PTH At Least Once • Phosphate At Least Once If uACR > 30 mg/g: • Serum Potassium Annually	Hemoglobin A1c as Needed to Monitor Glycemic Control • Carbon Dioxide At Least Once • PTH At Least Once • Phosphate At Least Once If uACR > 30 mg/g: • Serum Potassium Annually On Warfarin Therapy: • Prothrombin Time with INR Annually

Results:

Test Name	Current Result		Reference Interval		Units	Historical Result
	Optimal	Non-Optimal	Optimal	Non-Optimal		
CREATININE		1.3	0.50-1.03	≤0.49 OR ≥1.04	mg/dL	
EGFR		49	≥60	<60	mL/min/1.73m ²	
CREATININE, RANDOM URINE	25		20-275	≤19 OR ≥276	mg/dL	
ALBUMIN, URINE		0.5			mg/dL	
ALBUMIN/CREATININE RATIO, RANDOM URINE	20		<30	≥30	mg/mg creat	

Guidelines from the [Kidney Disease: Improving Global Outcomes \(KDIGO\) Initiative](#) and National Kidney Foundation (NKF) recommend a frequency of monitoring Chronic Kidney Disease based on Serum Creatinine and Albumin-Creatinine Ratio.

Based on this patient's Serum Creatinine and Albumin-Creatinine Ratio, KDIGO and NKF guidelines recommend follow-up screening with the Kidney Profile 1 time per year.

Normal	Albuminuria Categories and ACR Ranges (mg/g creatinine)	
	Moderately Increased	Severely Increased
<30	30-300	>300

CKD Stage and eGFR (range mL/min/1.73 m ²)	Albuminuria Categories and ACR Ranges (mg/g creatinine)		
	Normal	Moderately Increased	Severely Increased
1 and 2 ≥60	1	1	2,R
3A 45-59	1,C	2	3,R
3B 30-44	2	3	3,R
4 15-29	3,R	3,R	≥4,R
5 <15	≥4,R	≥4,R	≥4,R

- Low risk: monitor yearly if evidence of kidney damage (e.g., indicated by imaging or biopsy)
- Moderately high risk: monitor yearly
- High risk: monitor for 2 times yearly
- Very high risk: monitor 3 times yearly
- Very high risk: monitor 4 times yearly

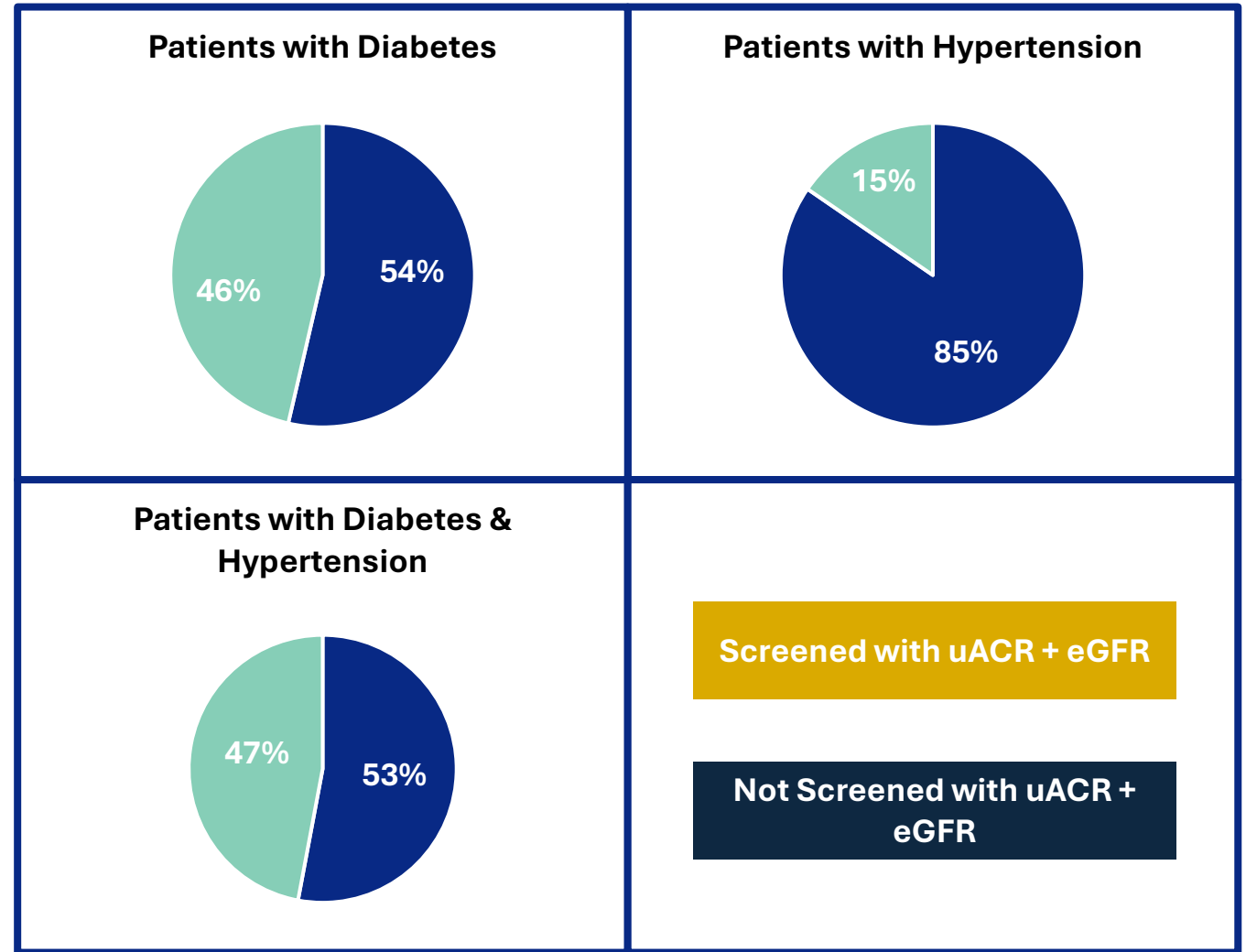
• C: Confirm using eGFR based on (1) cystatin C or (2) creatinine plus cystatin C
 • R: refer to specialist

Medical guideline-recommended follow-on testing

Overlay of patient's results on National Kidney Foundation Risk Map

Kidney Profile missed opportunities in FQHCs

- Screening for CKD (eGFR and uACR)
 - 26,097 pts w/ HTN – 17,817 did not have uACR with the eGFR
 - 26,099 pts w/ diabetes – 13,999 did not have uACR with the eGFR
 - 8,367 pts with HTN and diabetes – 3,560 pts did not have uACR with the eGFR



The data reflects 12 months of lab utilization from 179 FQHC locations throughout greater Connecticut.

Cost implications of early intervention

Find savings opportunities by predicting the **impact of CKD progression**

Our risk calculator for commercially insured members can help you anticipate risk and determine roughly **how much CKD progression is costing your organization** based on Quest real-world data and published studies.

Simply enter the number of commercially insured adult members you cover or patients your providers treat, and we'll estimate:

- Annual cost of CKD progression
- Which member segments are driving the cost of progression

Enter figures as numerals only and without commas, eg, enter 1,000,000 as 1000000

This calculator provides output data based on inputs provided by the user and may not include all variables that could affect healthcare cost assessments.

Enter commercially insured members

60,000

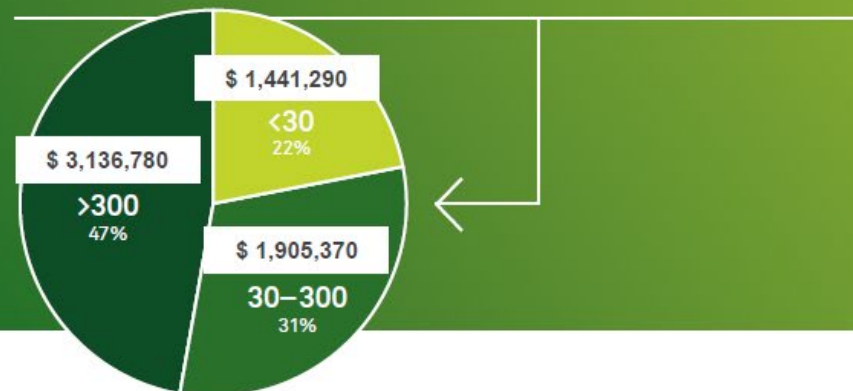
Annual cost of CKD progression (\$-Est.)

\$6,483,440

470 members

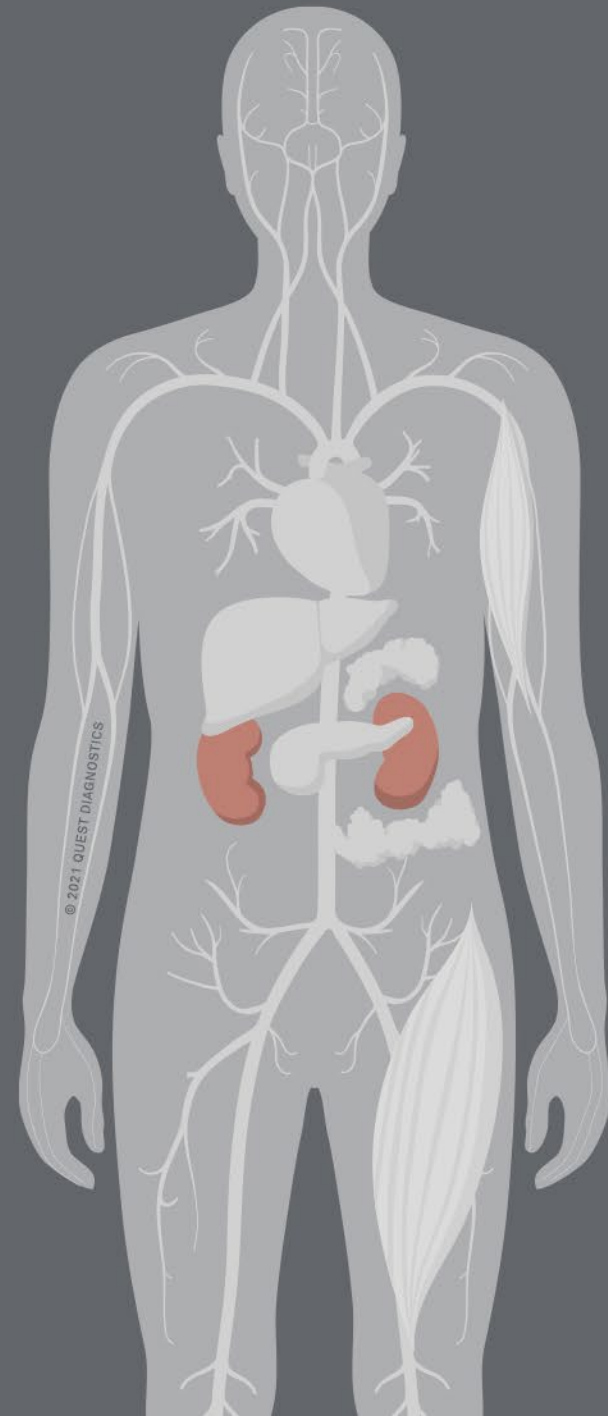
180 members with uACR >300 drive 48% of the cost of CKD progression

Urine Albumin-to-Creatinine Ratio (uACR)	Members with CKD (Est. #)	Members who progress (Est. #/Yr)	Annual cost of progression
<30	15,720	140	\$ 1,441,290
30-300	4,780	150	\$ 1,905,370
>300	2,180	180	\$ 3,136,780
Total	22,680	470	\$ 6,483,440

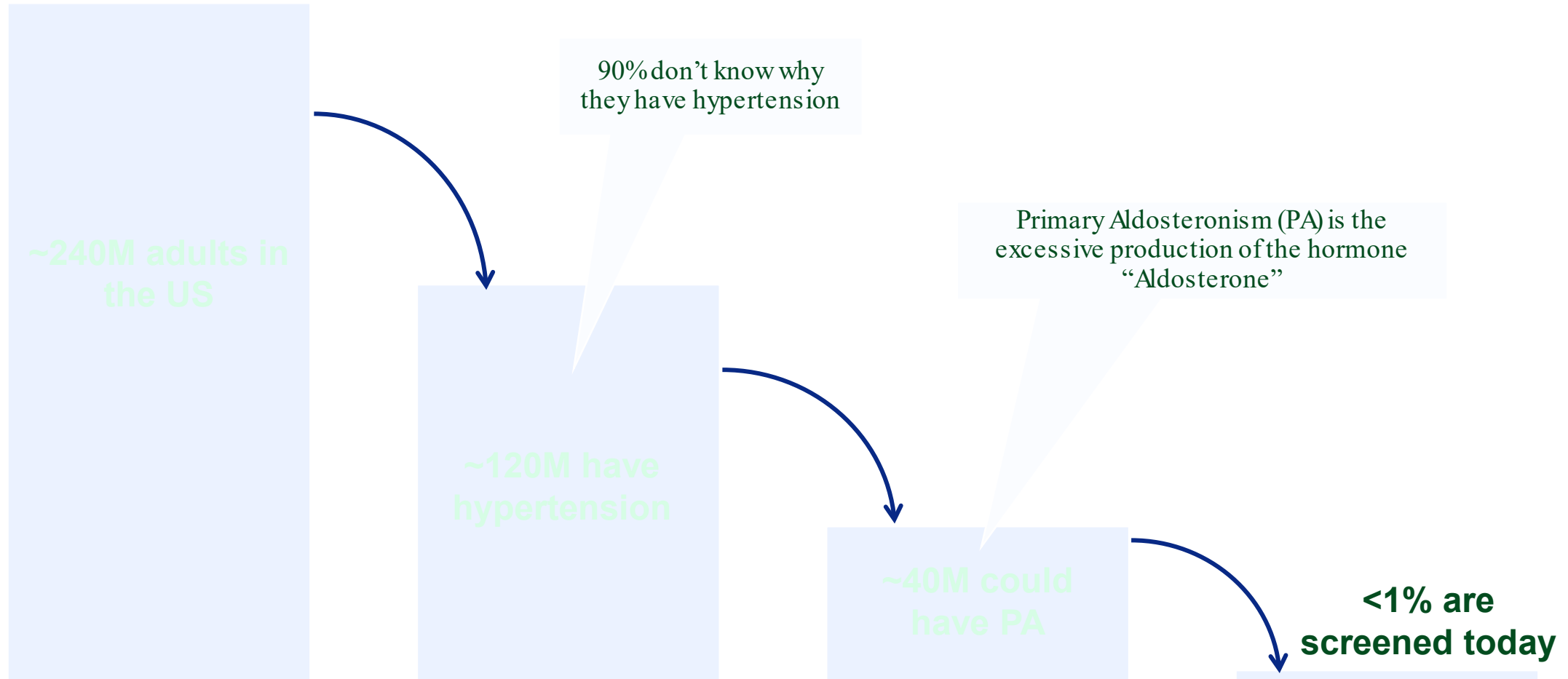


Primary Aldosteronism

Updated Protocol



50% of the adult population has hypertension (HTN)

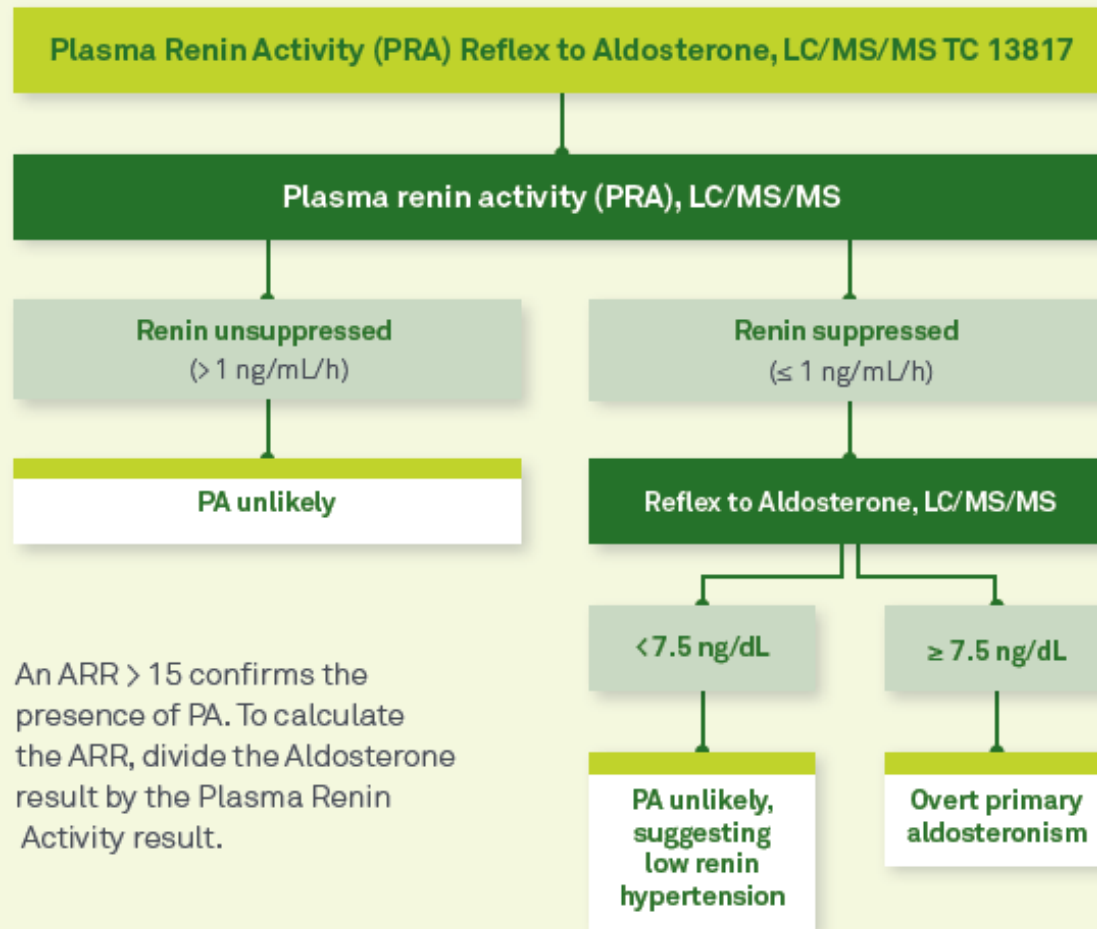


Primary Aldosteronism - Not just about hypertension

- Patients with known primary aldosteronism compared with matched (age, sex, BP) patients with essential hypertension are more likely to have the following conditions over a median duration of 8.8 years after diagnosis of hypertension.
 - Microalbuminuria (Odds Ratio 7.08)
 - Atrial fibrillation (OR 3.52)
 - Proteinuria (OR 2.68)
 - Stroke (OR 2.58)
 - Left ventricular hypertrophy (OR 2.29)
 - Coronary artery disease (OR 1.77)
 - Metabolic syndrome (OR 1.53)
 - Diabetes mellitus type 2 (OR 1.33)

Primary aldosterone screening

The 2025 Endocrine Society clinical practice guidelines on primary aldosteronism suggest that **all patients with hypertension** be screened for PA.¹



Considerations prior to testing:

- Assess potassium levels if not performed recently; low potassium may lead to a false positive for low aldosterone²
- Patient should cease mineralocorticoid receptor antagonist (MRA) or Epithelial Sodium Channel (ENaC) inhibitor use for 4 weeks prior to avoid interference with the renin-independent pathway²

1. Adler GK, Stowasser M, Correa RR, et al. Primary aldosteronism: an Endocrine Society clinical practice guideline. Endocrine Society. July 14, 2025. Accessed August 7, 2025. <https://www.endocrine.org/clinical-practice-guidelines/primary-aldosteronism-2>

2. Funder JW, Carey RM, Fardella C, et al. Case detection, diagnosis, and treatment of patients with primary aldosteronism: an Endocrine Society clinical practice guideline. J Clin Endocrinol Metab. 2008;93(9):3266-3281. doi:10.1210/jc.2008-0104

Primary aldosteronism (PA)

More common than previously thought

Problem

120 million

adults with hypertension

Up to 30%

could have primary aldosteronism

< 1%

current screening rate

Key Message

- New guidelines from the Endocrine Society recommend screening **all patients with HTN for PA**
- The **only symptom** to identify PA is hypertension
- If left untreated, PA can lead to serious health complications **including CVD, CKD, stroke, atrial fibrillation.**
- PA is characterized by **elevated aldosterone and low renin**

New, simplified screen for PA

- 1 Plasma Renin Activity (PRA) is ≤ 1 ng/mL/min
- 2 Aldosterone is ≥ 7.5 ng/mL
- 3 Aldosterone Renin Ratio (ARR) > 15

Meets criteria for Primary Aldosteronism

Primary Aldosteronism

Plasma renin activity with reflex to Aldosterone

Panel components include:
Plasma renin activity, LC/MS/MS; Aldosterone, LC/MS/MS

The data reflects 12 months of lab utilization from 179 FQHC locations throughout greater Connecticut.



Research indicates that up to 30% of patients with hypertension have primary aldosteronism (PA)



In the past 12 months:

- 26,097 patients in your practice have essential hypertension
- 183 patients were screened for PA, while up to 7,774 could have PA

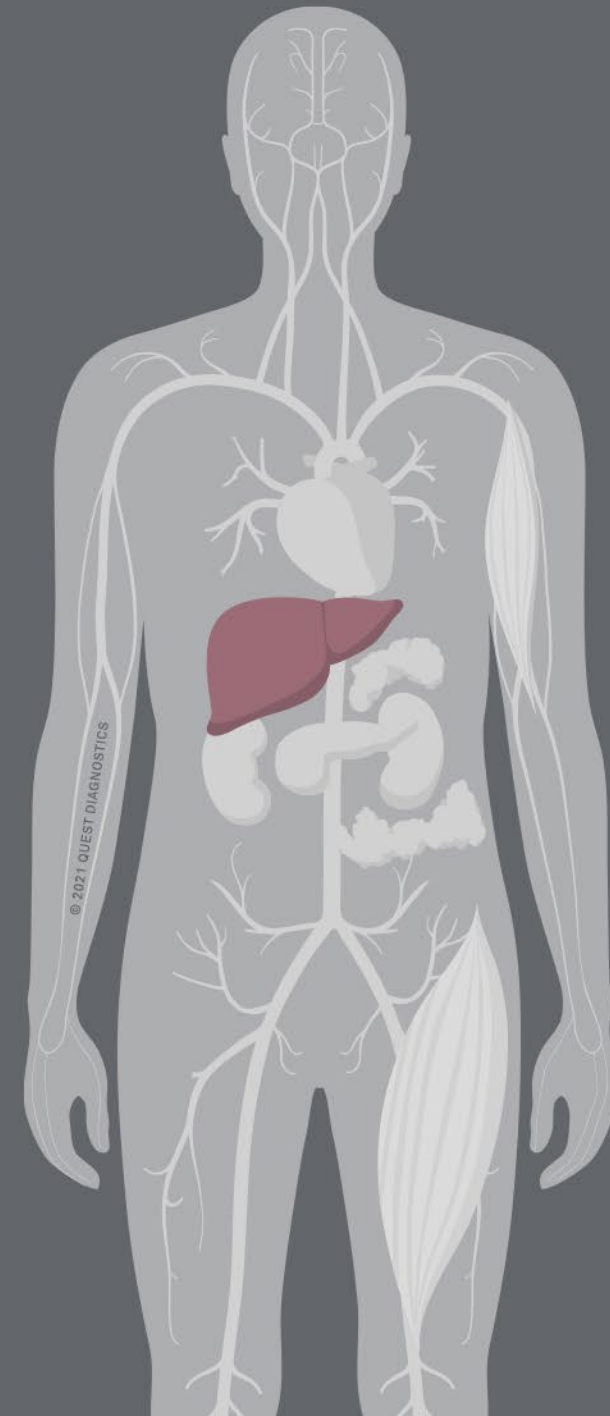


Patients with untreated PA have a **higher risk** of cardiovascular, kidney, and metabolic disease when compared to essential hypertensive patients.

Liver Disease

Fibrosis 4 (FIB4) Index

Enhanced Liver Fibrosis (ELF)



Factors contributing to prevalence and outcomes of MASLD^{1,2}



100 million
are estimated to have
NAFLD



6.6 million
will eventually
have liver fibrosis



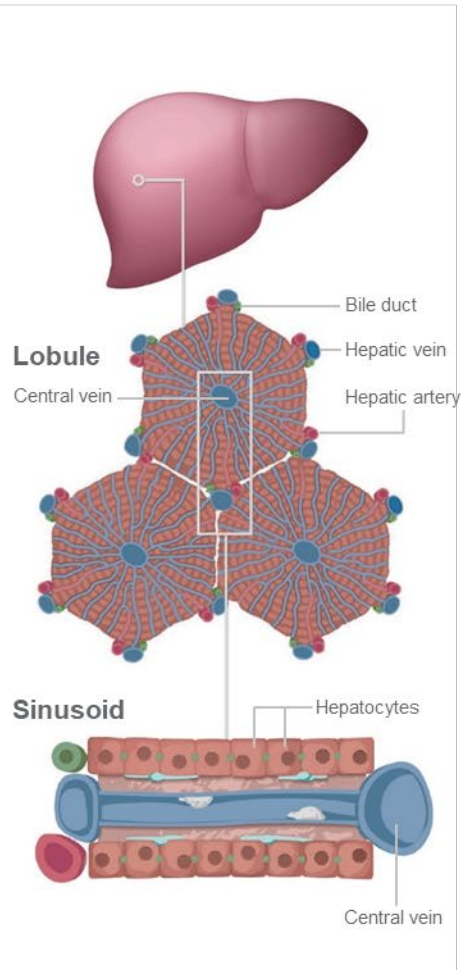
<5%
of MASLD cases have been
diagnosed²

- Rising rates of metabolic dysfunction, obesity, and type 2 diabetes mellitus (T2DM) contribute to increased prevalence of metabolic dysfunction-associated steatotic liver disease (MASLD)
 - Hyperinsulinemia has been shown to contribute to the development of MASLD³
- Early MASLD is clinically silent
- Advanced stages (fibrosis/cirrhosis) can result in
 - Liver failure, ultimately requiring transplant
 - Liver cancer
 - Risk for coronary artery disease

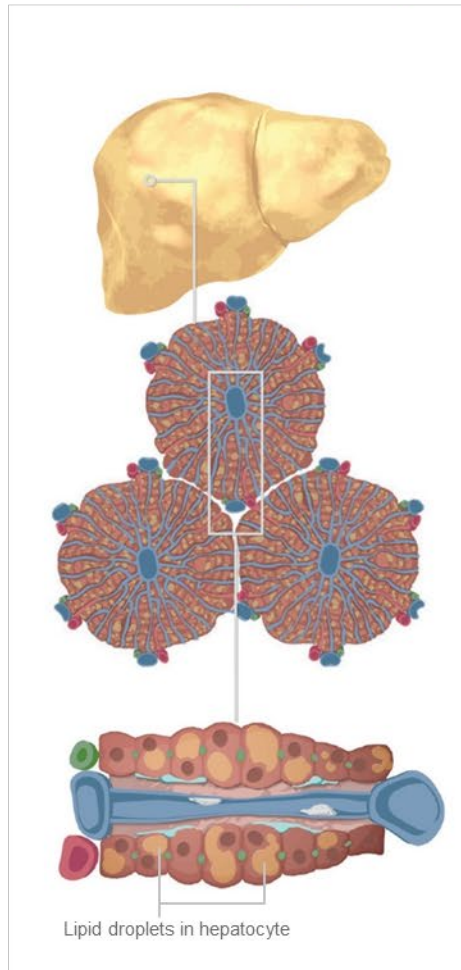
1. Cusi K, et al. 2022. doi:10.1016/j.eprac.2022.03.010 2. Rinella ME, et al. 2023. doi:10.1097/HEP.000000000000323 3. Bril F, et al. 2021. doi:10.1210/clinem/dgab417

Pathophysiology: progression of MAFLD

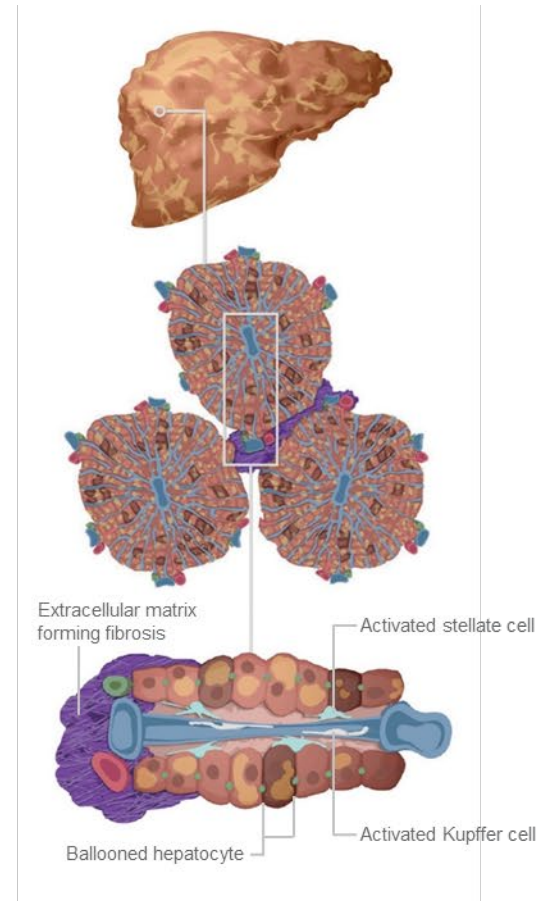
Healthy liver



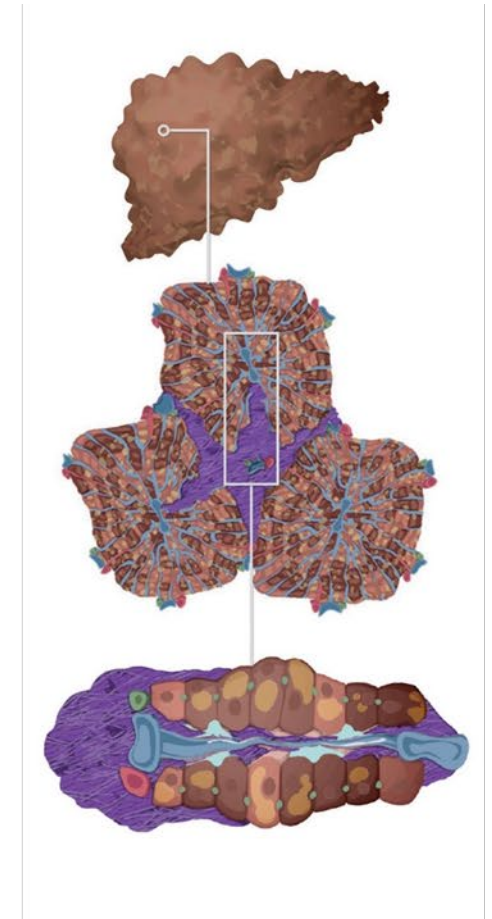
Steatosis (fatty liver)



Early metabolic dysfunction-associated steatohepatitis (MASH)



Late MASH with Fibrosis



Fibrosis-4 (FIB-4) Index

American Association for the Study of Liver Diseases (AASLD) recommends the FIB-4 index as a noninvasive approach to identify patients with a high **likelihood of advanced fibrosis**.¹

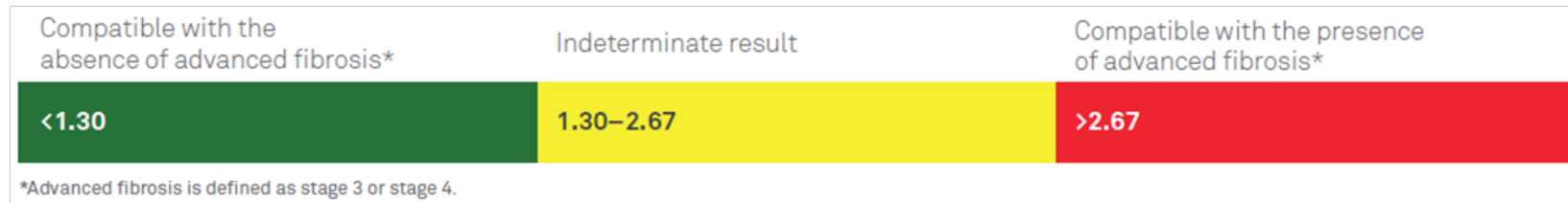
What is the FIB-4 index?

- A score based on patient age (years), aspartate aminotransferase (AST), alanine aminotransferase (ALT), and platelet count (PLT)

$$\frac{\text{Age x AST (U/L)}}{\text{PLT (10}^9\text{/L) x } \sqrt{\text{ALT (U/L)}}} = \text{FIB-4}$$

Clinical utility

- Rule out patients at low risk of advanced fibrosis from unnecessary specialized care, and determine which patients need additional assessment
- FIB-4 index interpretation information for patients with MASLD²:
 - Approximate distribution of FIB-4 index results, based on KOL input: 50-65% low, 30-40% indeterminate, 5-10% high



Which patients should receive the FIB-4 index?

- Insulin resistance, prediabetes, and type 2 diabetes
- Metabolic syndrome components, eg, high triglycerides
- Liver enzymes elevated
- BMI ≥30
- Fatty liver identified via imaging

1 Chalasani N, Younossi Z, Lavine JE, et al. The diagnosis and management of nonalcoholic fatty liver disease: practice guidance from the American Association for the Study of Liver Diseases. Hepatology. 2018;67(1):328-357. doi:10.1002/hep.29367

2 Kumar R, Teo EK, How CH, et al. A practical clinical approach to liver fibrosis. Singapore Med J. 2018;59(12):628-633. doi:10.11622/smedj.2018145

Enhanced Liver Fibrosis (ELF) Score

An easy, noninvasive way to assess risk of MASH disease progression in patients **with advanced fibrosis**

What is it?

- The first routine, standardized, direct biomarker blood test for prognostic risk assessment in advanced MASH
- FDA indication: ELF is indicated as a **prognostic marker** in conjunction with other laboratory findings and clinical assessments in **patients with advanced fibrosis (F3 or F4) due to MASH** to assess the **likelihood of progression to cirrhosis and liver-related clinical events**
- Score is based on 3 direct markers of liver fibrosis (components of the extracellular matrix that forms fibrosis): hyaluronic acid, procollagen III N-terminal peptide, tissue inhibitor of metalloproteinase

Clinical utility

- Identify patients at risk of progression who need urgent intervention
- ELF score result identifies risk of disease progression to cirrhosis or Liver Related Events (LRE eg, transplant, death):

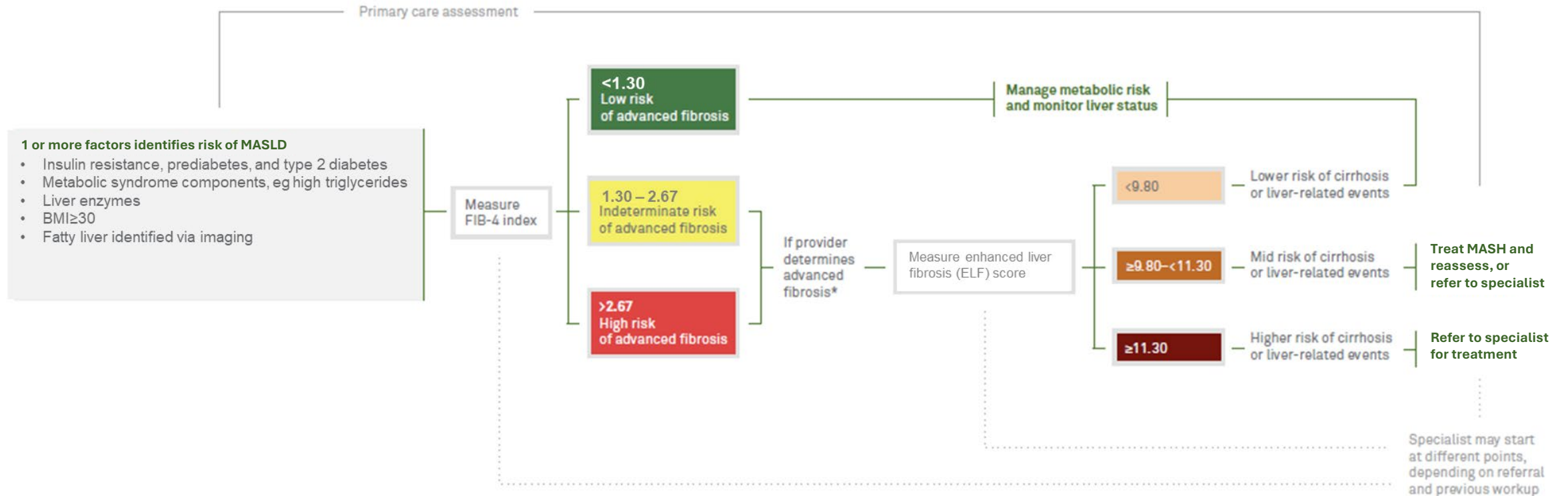
ELF Score	Risk of Disease Progression (Development of Cirrhosis or Liver-Related Events)
<9.80	Lower
≥9.80–<11.30	Mid ^a
≥11.30	Higher

^aIn the Mid group, the risk of disease progression is similar to the pre-test risk. Pretest risk refers to the likelihood of disease progression in the overall intended use population without considering the ELF Score. Results should always be interpreted in conjunction with the patient's medical history, clinical presentation, and other findings.

Which patients should receive the ELF score?

- Indeterminate or high FIB-4 index

Testing pathway to assess late-stage risk of MASLD



Pathway adapted from publications by members of the American Gastroenterological Association, American Diabetes Association, American Osteopathic Association, Endocrine Society, Obesity Society, and the Global Council on NASH.

Metabolic dysfunction-associated steatotic liver disease (MASLD)

Comprehensive Metabolic Panel with Fibrosis-4 (FIB-4)

Panel components include:
Comprehensive metabolic panel; FIB-4 Index Panel

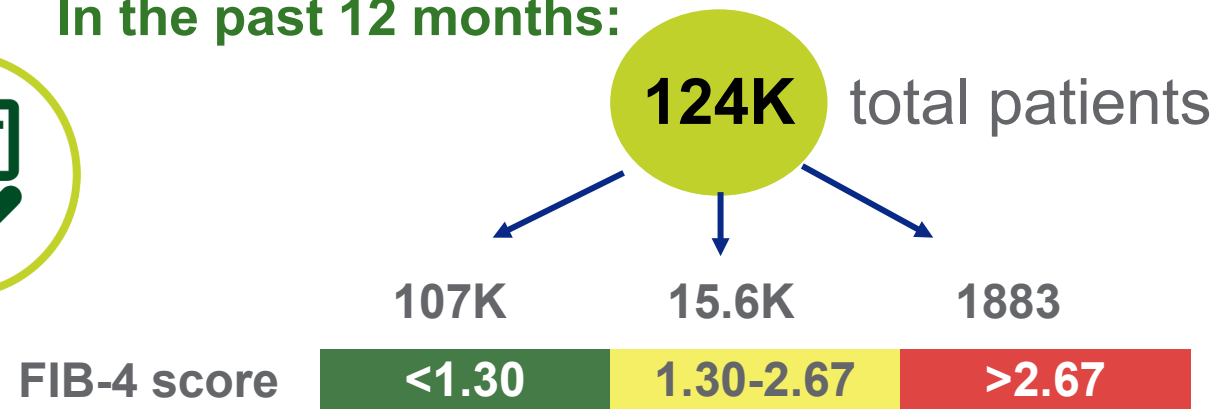
The data reflects 12 months of lab utilization from 179 FQHC locations throughout greater Connecticut.



48% of adults have MASLD, placing them at increased risk of progression to MASH and comorbidities like CVD and CKD



In the past 12 months:



FIB-4 is a calculation using age, AST, ALT and platelets



Utilizing the **CMP w/ FIB-4** provides the FIB-4 as an indication of liver fibrosis.

Riazi K, Azhari H, Charette JH, et al. The prevalence and incidence of NAFLD worldwide: a systematic review and meta-analysis. Lancet Gastroenterol. Hepatol. 2022;7(9):851-861. doi:10.1016/S2468-1253(22)00165-0.

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Areas of HEDIS/HRSA/UDS quality metrics impact

With affordable testing that is well covered...

- Screening with both eGFR and uACR together in patients with diabetes and/or hypertension increases the detection of patients progressing with CKD, allowing for earlier interventions to slow or stop the progression of CKD earlier.
 - Will meet and exceed quality metrics and realize significant cost savings to healthcare with better patient outcomes
- Screening essential hypertension patients for primary aldosteronism allows for interventions to address excess aldosterone.
 - Helps meet quality metric around hypertension control
 - Lowers associated cost associated with excess aldosterone, i.e. CHF, CKD, CVD, diabetes, and others
- Screening patients with Fibrosis 4 (FIB4) Index increases the detection of MASLD. Opportunity to intervene with weight loss and glycemic control strategy and reduce comorbidities associated with MASLD/MASH such as CVD, hypertension, diabetes, and others.

Thank you.
