



CHRONIC KIDNEY DISEASE (CKD)

Combined Cystatin C and Creatinine eGFR

For Improved CKD Diagnosis and Management



CKD Identification, Management and eGFR Limitations

Accurate assessment of GFR and albuminuria is important to determine the presence, stage and prognosis of CKD and to inform important treatment decisions, such as when to initiate hemodialysis or consider kidney transplant.¹

Creatinine, the most common marker used for estimating GFR, has some limitations as it can be affected by non-renal factors including age, sex, race, muscle mass, physical activity, nutritional status, high vegetable and protein diets and certain medications.

Non-Renal Factors That Influence Creatinine—Based eGFR (eGFRcr)

Factors That Can Cause Higher eGFRcr¹

- Low muscle mass
- Low activity
- Lower extremity amputation
- Vegetarian diet
- Advanced heart failure
- Liver failure

Factors That Can Cause Lower eGFRcr¹

- Increased muscle mass
- Recent ingestion of cooked meat or protein supplements
- Certain medications, such as trimethoprim, dronedarone, and tyrosine kinase inhibitors

Creatinine and Cystatin C Together—A More Accurate eGFR

Cystatin C is considered to be a preferred, unbiased marker to serum creatinine for estimating GFR and is independent of diet, protein intake, ethnicity, sex, physical activity and muscle mass.²

GFR estimating equations that incorporate both creatinine and cystatin C values together are more accurate than equations that use either marker alone.²

Clinical Use of Cystatin C Can Benefit Many Patient Populations^{3,4}

- Those with variable muscle mass—children, elderly, athletes, body builders, amputees
- Pregnant women
- Malnourished individuals
- Patients on vegetarian diets
- Patients on high protein diets
- Individuals taking creatine dietary supplements
- Patients with advanced liver or heart failure
- Patients on medications that block distal tubule secretion
- Patients who need confirmation of kidney function prior to kidney donation
- Patients that require dose adjustments for certain medications that may be toxic to the kidneys



Kidney Disease: Improving Global Outcomes (KDIGO) Guidelines³

CKD Assessment

- Use serum creatinine and a GFR estimating equation for initial assessment of CKD
- Use additional tests (such as cystatin C) for confirmatory testing in specific circumstances:
 - when eGFR based on serum creatinine is less accurate
 - when confirmation of a decreased eGFR is warranted in specific circumstances where decisions depend on more accurate knowledge of the GFR, such as confirming a diagnosis of CKD, determining eligibility for kidney donation, or adjusting the dosage of toxic drugs that are excreted by the kidneys
- Measure cystatin C in adults with eGFR creatinine 45–59 mL/min/1.73 m² who do not have markers of kidney damage if confirmation of CKD is required

				Persistent albuminuria categories		
				Description and range		
				A1	A2	A3
KDIGO 2012—Prognosis of CKD by GFR and Albuminuria Categories				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			

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

The National Kidney Foundation and the American Society of Nephrology Task Force Recommendation⁵

“Recommends national efforts to facilitate increased, routine, and timely use of cystatin C, especially to confirm eGFR in adults who are at risk for or have CKD.”

“Combining filtration markers (creatinine and cystatin C) is more accurate and would support better clinical decisions than one marker alone.”

Labcorp Supports the NKF-ASN Task Force Recommendations

Labcorp is pleased to add new panels to our Chronic Kidney Disease Portfolio to help you make confident decisions for your patients' health. These new panels contain an eGFRcr-cys, one with the eGFR calculation alone and two in combination with the recommended urine tests, to simplify the ordering process for diagnosing or confirming CKD.

Test Name	Test No.
eGFR Creatinine-Cystatin C Calculation	121022
eGFR Creatinine-Cystatin C Calculation With Albumin:Creatinine Ratio, Urine	121054
eGFR Creatinine-Cystatin C Calculation With Albumin:Creatinine-Protein:Creatinine Ratios, Urine	121065

References

1. Shlipak MG, Inker LA, Coresh J. Serum Cystatin C for Estimation of GFR. *JAMA*. 2022 Aug 8; online ahead of print.
2. Inker LA, Eneanya ND, Coresh J, et al. New Creatinine- and Cystatin C-Based Equations to Estimate GFR without Race. *N Engl J Med*. 2021 Nov 4;385(19):1737-1749.
3. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney International Supplements*. 2013;3:1-150. Accessed at https://kdigo.org/wp-content/uploads/2017/02/KDIGO_2012_CKD_GL.pdf.
4. Inker LA, Titan S. Measurement and Estimation of GFR for Use in Clinical Practice: Core Curriculum 2021. *Am J Kidney Dis*. 2021 Nov;78(5):736-749. Epub 2021 Sep 11.
5. Delgado C, Baweja M, Crews DC, et al. A Unifying Approach for GFR Estimation: Recommendations of the NKF-ASN Task Force on Reassessing the Inclusion of Race in Diagnosing Kidney Disease. *Am J Kidney Dis*. 2022 Feb;79(2):268-288.e1.



Visit the online Test Menu at **Labcorp.com** for full test information, including CPT codes and specimen collection requirements.

