CLINICAL LABS OF HAWAII

Estimated Glomerular Filtration Rate (eGFR)

Test Update

Effective January 7, 2019, Clinical Labs of Hawaii will begin reporting estimated glomerular filtration rate (eGFR) using the improved Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation. The CKD-EPI equation will replace the current Modification of Diet in Renal Disease study (MDRD) equation.

Compared with the MDRD, the CKD-EPI formula has demonstrated greater accuracy, especially with eGFRs between 60 and 120 mL/min/1.73 m2. Based on this data, the CKD-EPI formula is currently recommended by the National Kidney Foundation (NKF) and Kidney Disease Improving Global Outcomes (KDIGO) organization.
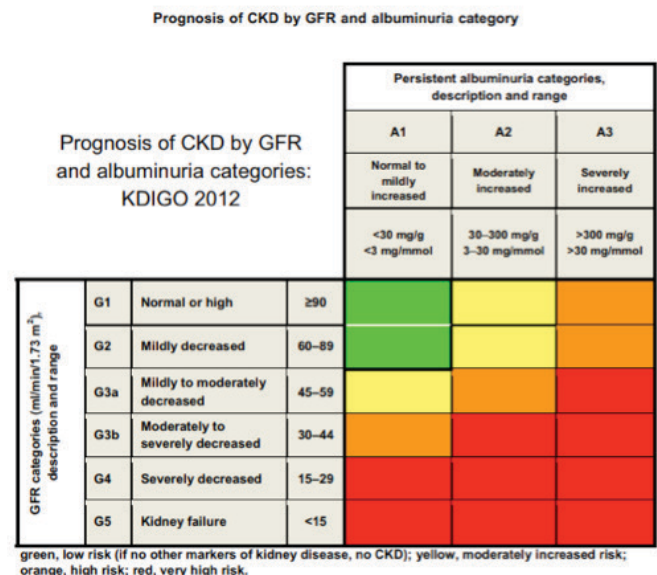
Limitations:

- Similar to other eGFR calculations, the CKD-EPI equation should only be used for patients with stable creatinine concentrations. It is less accurate in patients with extremes of muscle mass, restriction of dietary protein, ingestion of creatine, extra-renal metabolism of creatinine, or treatment with medications that affect renal tubular creatinine secretion.

- The CKD-EPI equation has limited usefulness in conditions such as pregnancy, patients with serious co-morbid conditions; and hospitalized patients, particularly those with acute renal failure.

- CKD-EPI eGFR use is not validated for patients less than 18 years old.

Reference Range:

eGFR	MDRD (current)	CKD-EPI (new)
≥18 years old	>59 mL/min/1.73 m2	≥90 mL/min/1.73 m2
<18 years old	Not applicable	Not applicable

Interpretation:

- Calculated eGFR will be reported routinely with all creatinine determinations for patients ≥ 18 years old.

- eGFR declines with age beginning at 40 years old, and it continues at a rate of approximately 10% per decade (Clin Kidney J. 2017; 10(4):545).

- The following "heat map" is provided to assist in the diagnosis and prognosis of chronic kidney disease according to GFR and albuminuria (KDIGO 2017).

Prognosis of CKD by GFR and albuminuria category

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/1.73 m²), 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.

References
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2. Levey AS, Stevens LA, Schmid CH, Zhang YL, Castro AF, 3rd, Feldman HI, et al. A new equation to estimate glomerular filtration rate, Ann Intern Med, 2009;150 (9):604-12.
3. Pottell H et al. Age-dependent reference intervals for estimated and measured glomerular filtration rate. Clin Kidney J. 2017; 10(4):545.
4. Kidney International Supplements (2017) 7, 1–59.
5. https://www.kidney.org/professionals/KDOQI/gfr
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