



**Example request or ticket to the information technology (IT) team to implement the CKD-EPI 2021 equation to calculate eGFR from creatinine.**

Additional implementation information is available in the report: National Kidney Foundation Laboratory Engagement Working Group Recommendations for Implementing the CKD-EPI 2021 Race-Free Equations for Estimated Glomerular Filtration Rate: Practical Guidance for Clinical Laboratories. *Clin Chem* 2022;68:511-20.

Result name: eGFRcr

Result type: calculation applied to all serum, plasma or whole blood creatinine results

Calculation equation variables: creatinine in mg/dL, age, sex

Calculation equation:

Programming logic for “IF” statements to select the correct equation for each set of parameters			
Age (years)	Sex	S <sub>cr</sub> (mg/dL) <sup>a</sup>	eGFRcr equation
≥18	Female	≤0.70 (or <0.71)	$= 142 \times (S_{cr} / 0.7)^{-0.241} \times 0.9938^{Age} \times 1.012$
		>0.70	$= 142 \times (S_{cr} / 0.7)^{-1.200} \times 0.9938^{Age} \times 1.012$
	Male	≤0.90 (or <0.91)	$= 142 \times (S_{cr} / 0.9)^{-0.302} \times 0.9938^{Age}$
		>0.90	$= 142 \times (S_{cr} / 0.9)^{-1.200} \times 0.9938^{Age}$

<sup>a</sup> S<sub>cr</sub> may be a creatinine value measured in serum, plasma or whole blood specimens.

eGFRcr attribute:

How reported:

Result Units	mL/min/1.73m <sup>2</sup>
Result comment applied to all results	eGFR was calculated using the 2021 CKD-EPI race-free equation.
Number of decimal places	zero, report in whole numbers
Reference or interpretative range	>60 mL/min/1.73m <sup>2</sup>
Reportable range	5-150 mL/min/1.73m <sup>2</sup> (note this reporting interval should be approved by the laboratory director; values <5 are reported as <5 and values >150 are reported as >150)
Position in flow sheet view of laboratory results	immediately follow the (serum) creatinine result
LOINC code for eGFRcr using 2021 CKD-EPI equation	98979-8

**Implementation notes:**

1. Discontinue existing calculated results for eGFR (if African American) and for eGFR (if not African American).
2. Do not chart results for the new eGFRcr in the same row in flow sheet view as the former results for eGFR (if African American) or for eGFR (if not African American). Results for the new eGFRcr should not be graphed continuously with results from older equations.

**Considerations for designating sex to use in the equations:**

Some LIS and EHR computer systems include data elements for sex at birth, legal sex, preferred sex, or other options. When only one sex designation exists, it is used. If the sex at birth and the legal sex are the same, either sex is used.

When the sex at birth does not match the legal sex or other sex designation, the laboratory director needs to collaborate with physician care providers and the IT team to define an acceptable option for reporting eGFRcr. Reporting options may include:

1. Do not report a value for the eGFRcr result and add a comment such as: “Because the sex at birth does not match other sex fields, an eGFRcr value is not calculated. Providers should use a calculator at the National Kidney Foundation (NKF) web site [https://www.kidney.org/professionals/kdoqi/gfr\\_calculator](https://www.kidney.org/professionals/kdoqi/gfr_calculator) to determine eGFRcr based on the clinically appropriate sex of the patient.”
2. Do not report a value for the eGFRcr result. Create additional result names such as eGFRcr(male) and eGFRcr(female) that are only result and reported when used. Use both male and female equations to calculate the respective values and add a comment to each such as: “Because the sex at birth does not match other sex fields, both male and female eGFRcr values are provided.”
3. Do not report a value for the eGFRcr result and add a comment that includes the values for a male and for a female. A comment could be: “Because sex at birth does not match other sex fields, a value for eGFRcr is not reported. For information, the eGFRcr value for a male is [add calculated value], and for a female is [add calculated value].”

Considerations regarding reporting eGFRcr when sex is ambiguous are reviewed in the AACC/NKF Guidance Document on Improving Equity in Chronic Kidney Disease Care. *J Appl Lab Med*, 2023;8:789-816.

**Age, sex and creatinine combinations to use for testing.**

The following table provides combinations of values that will test that the correct equation was used in all possible scenarios. These values can be used to test the build before it is put into use.

Age (years)	Sex	Creatinine mg/dL	eGFR <sub>cr</sub> (CKD-EPI 2021) mL/min/1.73m <sup>2</sup>
<18	Male		do not calculate
<18	Female		do not calculate
18	Male	0.90	127
18	Male	0.91	125
18	Female	0.70	128
18	Female	0.71	126
90	Male	0.50	97
90	Male	1.50	44
90	Female	0.50	89
90	Female	1.50	33
not available			do not calculate
	not available		do not calculate
Creatinine below or above the measuring interval (analytical measurement range)			do not calculate