

**Calculation of estimated glomerular filtration rate in WHI**

I. In 2009, Levey et al (1), and the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI), published a calculation for estimated glomerular filtration rate (eGFR) in a general population. This calculation computes eGFR (in units of ml/min/1.73 m<sup>2</sup> of body-surface area) for a sample with known serum creatinine values. It also uses age, sex, and Black race in the estimation. This calculation is the one that has been most frequently used in WHI research.

The 2009 CKD-EPI equation:

$$\mathbf{eGFR = 141 \times \min(S_{cr} / \kappa, 1)^\alpha \times \max(S_{cr} / \kappa, 1)^{-1.209} \times 0.9929^{Age} \times 1.018 \text{ [if female]} \times 1.159 \text{ [if black]}}$$

where:

- S<sub>cr</sub> is serum creatinine in mg/dL,
- κ is 0.7 for females and 0.9 for males,
- α is -0.329 for females and -0.411 for males,
- min indicates the minimum of S<sub>cr</sub> / κ or 1, and
- max indicates the maximum of S<sub>cr</sub> / κ or 1
- Age in years

II. Recent developments for reporting ethnic and racial groups in medical journals (2), have amplified concerns regarding the utility of using race to estimate kidney function (3), and is a topic of ongoing research (4-5).

Specifically, Inker et al (5, Table S10) published new CKD-EPI equations using age, sex, and serum creatinine or cystatin C, which do not use race as a factor. Relatively few WHI women have cystatin C results, so we provide the 2021 creatinine equation. We encourage WHI researchers to be mindful of these issues and to consider using the 2021 equation.

The 2021 CKD-EPI creatinine calculation (also in units of ml/min/1.73 m<sup>2</sup> of body-surface area), expressed as a single equation:

$$\mathbf{eGFR_{cr} = 142 \times \min(S_{cr} / \kappa, 1)^\alpha \times \max(S_{cr} / \kappa, 1)^{-1.200} \times 0.9938^{Age} \times 1.012 \text{ [if female]}}$$

where:

- S<sub>cr</sub> = serum creatinine in mg/dL
- κ = 0.7 (females) or 0.9 (males)
- α = -0.241 (female) or -0.302 (male)
- min(S<sub>cr</sub>/κ, 1) is the minimum of S<sub>cr</sub>/κ or 1.0
- max(S<sub>cr</sub>/κ, 1) is the maximum of S<sub>cr</sub>/κ or 1.0
- Age (years)

## References

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- (5) Inker, L. A., Eneanya, N. D., Coresh, J., Tighiouart, H., Wang, D., Sang, Y., Crews, D. C., Doria, A., Estrella, M. M., Froissart, M., Grams, M. E., Greene, T., Grubb, A., Gudnason, V., Gutiérrez, O. M., Kalil, R., Karger, A. B., Mauer, M., Navis, G., Nelson, R. G., ... Chronic Kidney Disease Epidemiology Collaboration (2021). New Creatinine- and Cystatin C-Based Equations to Estimate GFR without Race. *The New England journal of medicine*, 385(19), 1737–1749. <https://doi.org/10.1056/NEJMoa2102953>