

Reporting of estimated Glomerular Filtration Rate (eGFR)

It is estimated that 10-20 million people in the U.S. have chronic kidney disease (CKD) as defined by a glomerular filtration rate (GFR) of less than 60 ml/min/1.73 m² or persistent albuminuria (>30 mg urinary albumin/g urinary creatinine). CKD may go unrecognized in at-risk patients (i.e., diabetes, hypertension, cardiovascular disease, or family history of kidney disease) and progress to kidney failure without effective treatment. Assessment of CKD may be made by measurement of urinary albumin or a calculated estimate of GFR. Ratio of urinary albumin to urinary creatinine is the most sensitive methodology. However, estimation of GFR by the Modification of Diet in Renal Disease (MDRD) equation, based only on the patient's age, gender, race and serum creatinine is the most simple since serum creatinine is one of the most frequently ordered laboratory tests in clinical practice.

There is also a growing need from the radiological and cardiovascular physician communities to use eGFR as an estimate of renal function prior to administration of contrast media. This approach is superior to the use of serum creatinine alone. To allow for this enhanced use of the eGFR calculation, its result should be located easily in the patient record and be reported on inpatients and outpatients.

What is estimated Glomerular Filtration Rate (eGFR) and how will it be reported?

The MDRD equation for estimation of GFR has been shown to be reliable for assessment of patients 18 years and older when serum creatinine results, age, gender, and race are known. The equation has been validated for predominantly white and African American populations with impaired renal function. The Laboratory will automatically use these variables to calculate and report out eGFR for all serum creatinine results ordered, not having a serum creatinine result in the previous 7 days. Since we may not be able to obtain information about the patient's race, African American and Caucasian results will be reported together in the patient record. The result of >60 ml/min/1.73m² will be displayed as such, since the MDRD equation for results of greater than 60 are considered unreliable. The report will also display National Kidney Foundation classifications for CKD stage 3 (eGFR 30-59), CKD stage 4 (eGFR 15-29), kidney failure, stage 5 (eGFR <15) in the comment section. Clinicians should be aware of certain limitations when using eGFR to estimate renal function.

Limitations of eGFR:

- Factors effecting serum creatinine results other than age, gender and race
 - Diet
 - Vegetarian diet – decrease
 - Ingestion of cooked meat – increase
 - Body Habitus
 - Muscular – increase
 - Malnutrition/muscle wasting/amputation – decrease
 - Medications
 - Trimethoprim, cimetidine, keto acids and cephalosporins – increase
- Hospitalized patients
 - eGFR results for hospitalized patients should be used with caution since serum creatinine results are inaccurate when not in steady state, the patient is malnourished or on medications interfering with measurement of serum creatinine.
- Drug dosing
 - eGFR should not be used when calculating drug dosages. Creatinine clearance and the Cockcroft-Gault equation should be used instead. Pharmacists cannot generally deviate from the Cockcroft-Gault equation

because they are locked into whatever the pharmaceutical manufacturers recommend as a procedure for estimating doses of various medications.

For more information:

Consult www.nkdep.nih.gov/professionals/index.htm or contact Stephen Manzella, Ph.D. from the York Hospital Laboratory at (717) 851-2549.