



Midwest CKD Coalition Position Paper on GFR Reporting by Laboratories May 15, 2007

Use of a prediction equation to estimate glomerular filtration rate (GFR) from serum creatinine is useful and should be employed for people with chronic kidney disease (CKD) and those at risk for CKD (diabetes, hypertension, and family history of kidney failure). This is a recommendation of the National Kidney Disease Education Program (NKDEP) of the NIH and the Kidney Disease Outcomes Quality Initiative (KDOQI) of the National Kidney Foundation, and is the method referenced for definition of CKD in the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC7) of the NIH. All recommend the **Modification of Diet in Renal Disease** (MDRD) equation for adults. NKDEP and KDOQI advocate routine reporting by laboratories of GFR estimates with serum creatinine. Indeed, several health systems have begun this practice. The Midwest CKD Coalition strongly endorses this position and recommends that all laboratories report the MDRD GFR with every serum creatinine determination. Indeed, it is the position of the Midwest CKD Coalition that reporting the serum creatinine alone is at best incomplete data and may even give misleading information that could negatively affect patient care primarily through a failure to recognize significant chronic kidney disease in patients at stages when intervention can have significant benefits in reducing the risk of subsequent end stage renal disease.

The primary reasons for these recommendations are:

- **GFR and creatinine clearance are poorly inferred from the serum creatinine alone.**
 - This is mainly because these are related inversely (non-linearly) to serum creatinine and the effects of age and sex and, to a lesser extent race, on creatinine production further cloud interpretation.
- **Creatinine is more often measured than urinary albumin in practice.**
 - At present, adherence to guidelines for annual urinary albumin testing in diabetes is poor. Serum creatinine is more often measured than urinary albumin and if a depressed GFR is noted, the provider must confront CKD even if at a later stage than microalbuminuria.
- **Measurement of kidney function (GFR or creatinine clearance) is essential once albuminuria is discovered.**

- **The MDRD equation is the most thoroughly validated equation.**
 - Further validation is under way in more groups, for example in people with normal GFR, those with diabetes and Hispanics.
 - At the present time, the MDRD GFR equation is not validated for and should not be routinely used in children under the age of 18. Validation is under way and pediatric recommendations will be forthcoming.

- **The equation is superior to other methods of approximating GFR.**
 - Direct comparison of the MDRD equation to other equations such as Cockcroft–Gault and even 24-hour urine collections have proven this superiority.

- **Nephrology specialists routinely use an estimating equation now.**
 - The routine lab limits of normal for serum creatinine are so crude that specialists either explicitly apply an equation or, based on experience, estimate GFR. Primary care providers and other specialists should have that advantage.

- **The MDRD equation does not require weight as a variable.**
 - The equation yields a GFR normalized to 1.73 m² body surface area. It is true that most laboratory information systems do not include race. The result should be reported as X if non-African American and Y if African American. The user, patient or provider, can decide which is appropriate. The difference between races is not large, about 15%. A calculator is available at <http://www.nkdep.nih.gov/GFR-cal-adult.htm>. However, routine reporting of estimated GFR along with serum creatinine is highly desirable. As the NKDEP Laboratory Working Group establishes better standardization materials for the creatinine and the trueness of the assay in the lower range improves, routine reporting of values for children, using an appropriate estimating equation, is anticipated.

The CKD coalition recommends the following guidelines for laboratories to use in reporting the MDRD GFR:

- **GFR value reporting**
 - For GFR values above 60ml/minute report “>60ml/min.
 - For GFR values below 60ml/minute report the exact number from the equation

- **Race**
 - Report values for both “if African-American” and “if non-African-American”

- **Pediatrics**
 - Append report “not validated in Pediatric patients”

Examples:

- Serum creatinine 1.2 in an 70 year old woman. Laboratory report should state: GFR = 57mL/min/1.73m² if African-American;
GFR = 47mL/min/1.73 m² if non-African-American
- Serum creatinine 1.3 in a 30 year old man. Laboratory report should state: GFR >60mL/min/1.73m² if African-American;
GFR = 51 mL/min/1.73m² if non-African-American

REFERENCES

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