NOTICE OF CHANGE OF SERVICE

DATE: July 17, 2008

TO: Housestaff and PCN Physicians, Faculty, and Nursing Personnel

FROM: Sridevi Devaraj, PhD, DABCC, Director, Special Chemistry/Toxicology
       Gerald Kost, MD, PhD, Director, Automated Chemistry/Urinalysis
       Chris Jarvinen, Manager, Core Laboratory
       John Frey, Supervisor, Automated Chemistry/Urinalysis Laboratory

RE: Estimated Glomerular Filtration Rate and the Diagnosis of Early Renal Failure

Effective July 21, 2008 an estimated glomerular filtration rate (eGFR) will be reported on certain patient populations using the Modification of Diet in Renal Disease (MDRD) Study equation.

The National Kidney Disease Education Program (NKDEP) suggests the use of an estimating or prediction equation to estimate glomerular filtration rate from serum creatinine for people with chronic kidney disease (CKD) and those at risk for CKD (diabetes, hypertension, cardiovascular disease, and family history of kidney disease). A suggested equation for this purpose is the MDRD Study equation. This equation requires four variables: serum/plasma creatinine, age in years (18 years or older), gender, and race (validated for Caucasian and African-American populations). Primary reasons for these recommendations are:

- GFR and creatinine clearance are poorly inferred from serum creatinine alone. This is mainly because these are related inversely (non-linearly) to serum creatinine. The effects of age and gender, and to a lesser extent race, on creatinine production further inhibit effective interpretation.

- Creatinine is more often measured than urinary albumin. For patients with diabetic nephropathy, increased urinary albumin excretion often occurs before decreases in GFR. However, serum creatinine is measured frequently and may be the initial screening test for CKD.

- Measurement of kidney function (GFR or creatinine clearance) is essential once albuminuria is present.

- The MDRD equation is the most thoroughly validated equation. Further validation is under way in additional populations (people with normal GFR, people with diabetes, and Hispanics).

- The MDRD 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 has proven this superiority.

- The normal serum creatinine reference interval does not necessarily reflect a normal GFR for an individual patient. Primary care providers and other specialists should routinely use an estimating equation to assess patients’ kidney function.

- The MDRD equation does not require weight or height variables. The equation yields a GFR result normalized to $1.73m^2$ body surface area, which is an accepted average adult body surface area.
REFERENCE RANGE:

>60 mL/min./1.73 square meters.

Note: The estimated GFR result assumes a steady-state and is most accurate for GFRs <60mL/min./1.73m². The eGFR is not reliable in certain groups, including severely ill patients. Also, patients >59 years of age can have a mildly reduced GFR due to aging. The MDRD equations used to estimate GFR have been validated only in Caucasians and African-Americans 18 – 70 years of age. The equations have not been validated in other population groups, including pregnant women, transplant recipients, medically unstable patients including those with acute renal failure, or in persons with extremes of body size, muscle mass, or nutritional status. Application of the MDRD calculation in these cases may lead to errors in GFR estimation.

For more information, please refer to the NKDEP website: http://www.nkdep.nih.gov/

APPROVED BY:  
Ragha Gandour-Edwards, MD  
Acting Chair  
Department of Pathology and Laboratory Medicine

cc:  
Bettye Andreos  
Carol Robinson, BRN  
Phillip Raimondi, MD  
Burl R. Don, MD  
Thomas Depner, MD  
Alan Sieffkin, MD  
Robert Taylor  
Darrell O’Sullivan  
Bill Dager, PharmD  
Ralph Green, MD, PhD  
Darrell O’Sullivan  
Sridevi Devaraj, PhD  
Tricia Parker, PharmD