MEMORANDUM

TO: All Physicians

FROM: Katalin Banki, M.D., Director of Core Laboratory
             Stephen Gwilt, MS,MT(ASCP)SH,SC, Supervisor. Core Laboratory

DATE: February 17, 2016

RE: **CKD-EPI creatinine equation to estimate GFR**

Effective March 7, 2016, the Core Laboratory at Upstate Medical University Downtown Campus will estimate creatinine-based glomerular filtration rate by using the 2009 CKD-EPI (Chronic Kidney Disease-Epidemiology Collaboration) equation.

Background:
The National Kidney Foundation recommends replacing the currently used MDRD equation by the CKD-EPI equation. The 2009 CKD-EPI
- is more accurate, particularly at higher GFR values of > 60 mL/min/1.73 m^2
- performs better in the elderly
- improves clinical risk assessment

Formula: $\text{eGFR} = 141 \times \min(S_{Cr}/\kappa, 1)^{\alpha} \times \max(S_{Cr}/\kappa, 1)^{-1.209} \times 0.993^{Age} \times 1.018 \text{ [if female]} \times 1.159 \text{ [if Black]}$

What is changing:
- The estimated GFR$_{creat}$ will be calculated for patients up to 80 years-of-age.
- Numeric values will be reported up to 120 mL/min/1.73 m^2.
- Compared to the MDRD, the prevalence of abnormal GFR (<60 mL/min/1.73 m^2) decreases (in the general population from 8.7% to 6.3%)
- eGFR will now be calculated on all ordered serum creatinines

What is not changing:
- eGFR are reported for African-Americans and non-African Americans
- eGFRcreat has to be calculated at the bedside for patients < 18 and >80 years-old
- Creatinine-based estimating equations are not recommended for use with:
  - unstable serum creatinine (pregnancy, serious co-morbid conditions, hospitalized patients, particularly those with acute renal failure)
  - extremes in muscle mass and diet (amputees, paraplegics, bodybuilders, obese patients, malnutrition, vegetarian or low-meat diet)

Creatinine Method: Jaffe method, traceable to isotope dilution MS, by Roche.
Performed: 24/7
Turn-around Time: STAT: 90 minutes
                     Routine: 4 hours
Reference Range: eGFR$_{creat}$ >60 mL/min/1.73 m^2

References:
Levey AS, Stevens LA, Schmid CH, et al. A New Equation to Estimate Glomerular Filtration Rate. Annals of internal medicine. 2009;150(9):604-612.

Kilbride HS et al. Accuracy of the MDRD (Modification of Diet in Renal Disease) study and CKD-EPI (CKD Epidemiology Collaboration) equations for estimation of GFR in the elderly. Am J Kidney Dis 2013 Jan 11;61(1):57-66