Current status of reporting eGFR

The general chemistry C-B Survey, June 2009, included questions regarding practices for reporting estimated glomerular filtration rate (eGFR) from serum creatinine results. Responses were received from 4441 participants (77%). Of those responding, 77% were reporting eGFR, up from 70% in 2008. Figure 1 shows the trend to report eGFR has increased markedly as the value of this parameter has become a well accepted practice for adult patients. Figure 2 shows that 74% reported eGFR with all creatinine results as recommended by the National Kidney Disease Education Program (NKDEP) and 12% only when requested. A number of other reporting practices were followed by 14% of laboratories including: when the creatinine exceeds the reference interval, triggered by various age/sex parameters (probably related to a reference interval concept), and along with basic metabolic or comprehensive metabolic panels (probably analogous to reporting with all or most creatinine results).

The NKDEP recommends to report estimated glomerular filtration rate (eGFR) with all serum/plasma creatinine results when it is appropriate and feasible to do so. The public health goal of the NKDEP is to identify patients with stage 3 chronic kidney disease (GFR 30-59 mL/min/1.73m²) so they can be put on treatment to slow progression of the disease. Because serum creatinine is not well correlated with kidney damage in the early stages of the disease, an eGFR value is more easily related to a patient’s kidney disease condition than is a creatinine value.

One of the reasons to report eGFR along with creatinine is because of the difficulty to relate values near the upper reference interval to kidney function. In addition, it is difficult to develop reliable reference intervals for creatinine because of the need to stratify by age and sex even for adults. Consequently, laboratories that only report eGFR when creatinine exceeds the reference interval may want to examine this practice and consider reporting eGFR for creatinine results less than the upper reference interval.

The NKDEP web site cautions that there are clinical conditions when an eGFR is not appropriate. The MDRD (Modification of Diet in Renal Disease) Study equation should only be used in individuals age 18 and older, has not been validated for use with the elderly (over 70 years of age), pregnant women, patients with serious comorbid conditions, or persons with extremes of body size, muscle mass, or nutritional status. GFR estimating equations have poorer agreement with measured GFR for ill hospitalized patients and for people with near normal kidney function. However, if a computer reporting system cannot identify patients for whom reporting eGFR is most appropriate, laboratories should report eGFR for all patients and allow the clinician to determine the suitability of a result for a patient’s condition.
Figure 3 shows the upper limit of the numeric eGFR value reported by laboratories. The NKDEP recommends not to report a numeric value for eGFR >60 mL/min/1.73m² because several factors combine to make the values more variable and biased lower than true GFR measured values. However, significant numbers of laboratories were reporting higher numeric values. The reasons for reporting eGFR values >60 mL/min/1.73m² were not gathered in the Survey.

The NKDEP creatinine standardization program has been underway since 2005. The goal of this program is to improve the uniformity of creatinine results and eGFR calculated using creatinine. Manufacturers have been changing the calibration of creatinine methods to be traceable to an isotope dilution mass spectrometry (IDMS) reference measurement procedure that is calibrated with a primary (pure substance) creatinine standard. Unfortunately, a large number of participants in this Survey did not designate the calibration traceability for the creatinine method used. Consequently, it was not possible to make a reliable estimate of the percent of laboratories using methods with calibration traceable to IDMS. However, all method and reagent manufacturers are expected to complete the transition to IDMS calibration traceability this year.

As in 2008, nearly all laboratories (79%) used the NKDEP recommended 4-parameter MDRD equation. It is very important that a laboratory use the correct version of the MDRD 4-variable equation when using a creatinine method that has its calibration traceable to IDMS. IDMS traceable methods will have lower values for creatinine and the IDMS traceable version of the MDRD 4-variable equation must be used.

There is not a version of the MDRD 6-variable, the Cockcroft-Gault or any other estimating equation for use with creatinine methods that have calibration traceable to IDMS. Use of such equations will produce erroneously high estimates of GFR or creatinine clearance and should be discontinued.

Additional information on reporting eGFR is available at the NKDEP web site: [http://www.nkdep.nih.gov/](http://www.nkdep.nih.gov/).

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