



**MEMORANDUM # 81**

**TO:** UNC Hospitals Housestaff, Attendings, Department Heads and Supervisors

**FROM:** *CH* Catherine A. Hammett-Stabler, Ph.D., Professor and Director, Core Laboratory  
*JB* John B. Buse, M.D., Ph.D., Director, UNC Diabetes Care Center  
*AC* Ali Calikogulu, M.D., Pediatric Endocrinology  
*KM* Kathy McKinney, MT (ASCP), Supervisor, Core Laboratory  
*MB* Mark Brecher, M.D., Professor and Chair, W. W. McLendon Clinical Laboratories

**SUBJECT:** **Automatic Calculation of Estimated Average Glucose (eAG)**

**DATE:** January 13, 2008

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Effective January 26, 2009, an estimated average glucose (eAG) will accompany each hemoglobin A<sub>1c</sub> test result reported through WebCIS.

The goal of reporting eAG in addition to the HbA<sub>1c</sub> is to provide health care providers with a more useful index of chronic glycemia and to improve patient understanding of their results. The calculation is considered analogous to the estimated glomerular filtration rate (eGFR) and evolved from a multinational study reported in 2008 which showed a linear relationship between HbA<sub>1c</sub> and average glucose. The study found no significant differences between the calculated eAG and gender, age, race, ethnicity, or type of diabetes. Multiple methods of HbA<sub>1c</sub> and glucose analysis (including point of care) were used. Although the initial study population did not include children, pregnant women, or a significant Asian (China or India) population, most diabetes experts agree that the lack of variation across other populations suggest the calculation is appropriate for these populations and should be used at this time. It is likely that the calculation will be refined in the future as additional studies are performed. We realize that many health care providers are already using tables to estimate the average glucose and hope the addition of this calculation will standardize the activity and reduce the likelihood of errors.

The equation is  $AG_{mg/dL} = 28.7 \times HbA_{1c} - 46.7$ .

There are three important points to note: First, there will not be a reference range associated with the calculation. Second, the calculation cannot be performed when the HbA<sub>1c</sub> concentrations are outside the analytical measuring ranges. Third, the eAG and the average glucose on a patient's meter may differ substantially because of the estimated nature of the calculated eAG, the frequency and time of day home glucose monitoring is being performed, as well as the particular meter used.

There is no charge for this calculation and no test order is necessary, other than Hemoglobin A<sub>1c</sub>. Please contact Dr. Hammett-Stabler or Ms McKinney (6-2361, Core Laboratory) for information or questions.

**References:**

1. Nathan DM, Kuenen J, Borg R, et al. Translating the A1c Assay into Estimated Average Glucose Values. *Diabetes Care*. 2008;31(8):1473-78.