

Approaches for Improving Glucose Monitor Measurements for Self-Monitoring of Blood Glucose: From Measurement Harmonization to External Quality Assessment Programs

Hubert W. Vesper, Ph.D. and Gary L. Myers, Ph.D.

Abstract

Self-monitoring of blood glucose (SMBG) is an important component in diabetes management, helping patients to achieve and maintain normal blood glucose levels. The benefit of SMBG depends on the quality of the measurement performed. Therefore, it is important to know the factors affecting the measurements and to assure that the quality of SMBG measurements is at the highest achievable level possible. To accomplish this, all aspects of the measurement procedure need to be taken into consideration. Sources of variability can be related to the monitor itself, its calibration and use, including blood collection. Improving the variability caused by each source requires specifically designed and targeted efforts. Variability related to the monitor can be assessed in studies that minimize other sources of variability. Variability related to monitor calibration can be assessed and minimized through harmonization or standardization programs, while variability related to the use of the monitors can be addressed through patient-oriented assessment and training. The latter may follow procedures similar to external quality assessment (EQA) programs used in clinical laboratory medicine. However, to obtain an optimal impact on patient care, such programs need to have a wide reach and the social and cultural competency to work efficiently with all patients. The EQA approach or approaches that would provide the most benefit to the patient remain to be determined.

J Diabetes Sci Technol 2007;1(2):153-157

Author Affiliation: Division of Laboratory Sciences, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, Georgia

Abbreviations: (ADA) American Diabetes Association, (EQA) external quality assessment, (ISO) International Organization for Standardization, (SMBG) self-monitoring of blood glucose

Keywords: calibration, device handling, EQA components, external quality assessment, factors affecting measurement variability, harmonization, measurement variability, self-monitoring of blood glucose, specimen collection, standardization

Corresponding Author: Hubert W. Vesper, Ph.D., Division of Laboratory Sciences, National Center for Environmental Health, Centers for Disease Control and Prevention, 4770 Buford Hwy, NE (MS F-25), Atlanta, GA 30341; email address HVesper@cdc.gov