

Factors Affecting Blood Glucose Monitoring: Sources of Errors in Measurement

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Abstract

Glucose monitoring has become an integral part of diabetes care but has some limitations in accuracy. Accuracy may be limited due to strip manufacturing variances, strip storage, and aging. They may also be due to limitations on the environment such as temperature or altitude or to patient factors such as improper coding, incorrect hand washing, altered hematocrit, or naturally occurring interfering substances. Finally, exogenous interfering substances may contribute errors to the system evaluation of blood glucose.

In this review, I discuss the measurement of error in blood glucose, the sources of error, and their mechanism and potential solutions to improve accuracy in the hands of the patient. I also discuss the clinical measurement of system accuracy and methods of judging the suitability of clinical trials and finally some methods of overcoming the inaccuracies. I have included comments about additional information or education that could be done today by manufacturers in the appropriate sections. Areas that require additional work are discussed in the final section.

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Abbreviations: (ADA) American Diabetes Association, (FDA) Food and Drug Administration, (ISO) International Standards Organization, (MARE) mean absolute relative error, (SMBG) self-monitoring of blood glucose

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