

## Blood Glucose Testing in the Hospital: Error Sources and Risk Management

James H. Nichols, Ph.D., DABCC, FACB

### Abstract

Glucose testing in the hospital with point-of-care devices presents multiple opportunities for error. Any device can fail under the right conditions. For glucose monitoring in the hospital, with thousands of operators, hundreds of devices, and dozens of locations involved, there is ample opportunity for errors that can impact the quality of test results. Errors can occur in any phase of the testing process: preanalytic, analytic, or postanalytic. Common sources of meter error include patient or methodology interferences, operator mistakes, environmental exposure, and device malfunction. Early models of glucose meters had few internal checks or capability to warn the operator of meter problems. The latest generation of glucose monitors has a number of internal checks and controls engineered into the testing process to prevent serious errors or warn the operator by suppressing test results. Some of these control processes are built into the software and data management system of the meters, others require the hospital to do something, such as regularly clean the meter or analyze control samples of known glucose concentration, to verify meter performance. Hospitals need to be aware of the potential for errors by understanding weaknesses in the testing process that could lead to erroneous results and take steps to prevent errors from occurring or to minimize the harm to patients when errors do occur. The reliability of a glucose result will depend on the balance of internal control features available from manufacturers in conjunction with the liquid control analysis and other control processes (operator training, device validation, and maintenance) utilized by the hospitals.

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**Author Affiliations:** Tufts University School of Medicine, Boston, Massachusetts; and Department of Pathology, Baystate Health, Springfield, Massachusetts

**Abbreviations:** (CLIA) Clinical Laboratory Improvement Amendments

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**Corresponding Author:** James H. Nichols, Ph.D., DABCC, FACB, Clinical Chemistry, Baystate Health, 759 Chestnut Street, Springfield, MA 01199; email address [james.nichols@baystatehealth.org](mailto:james.nichols@baystatehealth.org)