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REVIEW ARTICLE

Blood Glucose Measurement in the Intensive Care Unit: What Is the Best Method?

Huong T. Le, M.D.,[1] Neil S. Harris, M.D.,[1] Abby J. Estilong, MLS(ASCP)^{CM},[2] Arvid Olson, M.B.A.,[2] and Mark J. Rice, M.D.[1]

Abstract

Abnormal glucose measurements are common among intensive care unit (ICU) patients for numerous reasons and hypoglycemia is especially dangerous because these patients are often sedated and unable to relate the associated symptoms. Additionally, wide swings in blood glucose have been closely tied to increased mortality. Therefore, accurate and timely glucose measurement in this population is critical. Clinicians have several choices available to assess blood glucose values in the ICU, including central laboratory devices, blood gas analyzers, and point-of-care meters. In this review, the method of glucose measurement will be reviewed for each device, and the important characteristics, including accuracy, cost, speed of result, and sample volume, will be reviewed, specifically as these are used in the ICU environment. Following evaluation of the individual measurement devices and after considering the many features of each, recommendations are made for optimal ICU glucose determination.

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Author Affiliations: [1]Department of Anesthesiology, University of Florida College of Medicine, Gainesville, Florida; and [2]Shands Medical Laboratories, University of Florida College of Medicine, Gainesville, Florida

Abbreviations: (BGA) blood gas analyzer,(CLD) central laboratory device, (CV) coefficient of variation, (EGA) error grid analysis, (FDA) Food and Drug Administration, (GDH) glucose-1-dehydrogenase, (GOx) glucose oxidase, (ICU) intensive care unit, (IIT) intense insulin therapy, (NAD) nicotinamide adenine dinucleotide, (POC) point of care, (PQQ) pyrroloquinoline quinone, (TAT) turnaround time

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Corresponding Author: Mark J. Rice, M.D., University of Florida College of Medicine, P.O. Box 100254, Gainesville, FL 32610-0254; email address *mrice@anest.ufl.edu*