

Glucose Information for Tight Glycemic Control: Different Methods with Different Challenges

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Abstract

Rigorous glucose control is essential for prevention of diabetes-related complications in diabetes patients. Even without diabetes, tight glucose control is beneficial in hospitalized, critically ill patients.

Actually, three different glucose measurement methods are used: (1) hand held devices, (2) blood-gas analyzers, and (3) laboratory analyzers in core laboratories. Each method is subject to specific challenges and limitations that can affect the overall system performance.

In this article, we aim to demonstrate that even glucose measurement results from core laboratories (professional laboratory systems) do not necessarily reflect the absolute “true” glucose level of a patient.

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Abbreviations: (A1C) glycosylated hemoglobin A1c, (BG) blood glucose, (BGA) blood-gas analyzer, (DCCT) Diabetes Control and Complications Trial, (FAD) flavine adenine dinucleotide, (GDH) glucose dehydrogenase, (GOx) glucose oxidase, (ICU) intensive care unit, (IFCC) International Federation of Clinical Chemistry and Laboratory Medicine, (ISO) International Organization for Standardization, (NAD) nicotinamide adenine dinucleotide, (NADPH) reduced nicotinamide adenine dinucleotide phosphate, (PQQ) pyrrolo quinoline quinine, (SMBG) self-monitoring of blood glucose, (UKPDS) United Kingdom Prospective Diabetes Study

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