Challenges to Glycemic Measurement in the Perioperative and Critically Ill Patient: A Review

Andrew D. Pitkin, M.B.B.S., MRCP, FRCA, and Mark J. Rice, M.D.

Abstract

Accurate monitoring of glucose in the perioperative environment has become increasingly important over the last few years. Because of increased cost, turnaround time, and sample volume, the use of central laboratory devices for glucose measurement has been somewhat supplanted by point-of-care (POC) glucose devices. The trade-off in moving to these POC systems has been a reduction in accuracy, especially in the hypoglycemic range. Furthermore, many of these POC devices were originally developed, marketed, and received Food and Drug Administration regulatory clearance as home use devices for patients with diabetes. Without further review, many of these POC glucose measurement devices have found their way into the hospital environment and are used frequently for measurement during intense insulin therapy, where accurate measurements are critical. This review covers the technology behind glucose measurement and the evidence questioning the use of many POC devices for perioperative glucose management.