

Frequently Repeated Glucose Measurements Overestimate the Incidence of Inpatient Hypoglycemia and Severe Hyperglycemia

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Abstract

Objective:

The aim was to determine if frequently repeated glucose measurements mandated by an inpatient protocol led to falsely elevated reported rates of both hypo- and hyperglycemia.

Methods:

In our academic medical center, a mandatory standardized subcutaneous insulin order form and protocol was implemented in May 2006. We analyzed point-of-care blood glucose (BG) measurements collected on all medical/surgical wards during the month of August in both 2005 and 2006 by all BGs measured, by patient admission, and by monitored patient-day. We then repeated all analyses using an algorithm that excluded BG values if another BG was measured less than 5 minutes later or 5–60 minutes earlier.

Results:

In 2005 versus 2006, there were 7034 versus 8016 glucoses measured in 397 versus 389 patients over 1704 versus 1710 patient days, respectively. Analyses based on patient-day balanced differences in BG measurement frequency and patient length of stay. In both years, failure to exclude repeat values overestimated both the proportion of patient days with hypoglycemia (3.5% versus 1.8% in 2005, $p = .003$; 2.6% versus 1.3% in 2006, $p = .007$) and severe hyperglycemia (9.3% versus 7.4% in 2005, $p = .09$; 7.7% versus 5.9% in 2006, $p = .08$). Mean, median, and proportion of patient-day means within our target range (80–150 mg/dl) were not significantly different.

Conclusions:

Glucometric reports should exclude repeated BG measurements from a single clinical episode of hypo- or hyperglycemia in order to accurately reflect inpatient glycemic control.

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Abbreviations: (BG) blood glucose

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