

Education of Untrained Hospital Staff for Decentralizing of Reflectometric Blood Glucose Assay

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To increase efficiency in larger public hospitals reflectometry of blood glucose has been one of the objects for decentralizing because of fast bedside results. Here, we report our preliminary experience with teaching hospital staff previously untrained in laboratory procedures.

Methods: Personnel (n=49) were gathered in groups and trained in a 2 hours program. Glucometer (Ames/Bayer, A/B, Elkhart Ind.) and Dextrostix (a wash-out strip, A/B) instructions were given orally and as handouts. The importance of the size of the blooddrop, reaction time and terminating the reaction was emphasized. First, glucose control solutions were used to determine the number of outliers off the assigned values. Precision of replicates (n=5) was assessed by assaying a pool of EDTA blood with a known glucose content. Then, the trainees obtained capillary blood from each other and determined the accuracy of the mean of their duplicates against a split capillary sample measured in an automated hexokinase method.

Results: The control solution assay showed that the glucose concentration was overestimated by about 10%. The number of outliers was 9/49. The precision of replicates was plotted against relative frequency. This plot demonstrated (less 3 outliers with C.V.% >20%) two groups. One with a mean C.V. of 5+2% (n=29) and another with a mean C.V. of 10+3% (n=10). Accuracy showed a regression equation Y (teststrip) = 0.75X (hexokinase method) + 0.5X (n=49, r=0.79, range 4–8 mmol/L).

Discussion: Training lowered the apparent number of outliers during the ongoing program. Precision testing spotted analysts with problems. The largest group of analysts had good precision while a smaller group was identified for re-training. Accuracy data point at difficulties with the wash-out procedure.

Conclusion: Extensive training is necessary for acceptable handling of wash-out strips. External control remains imperative for meaningful decentralizing of blood glucose.