wait for 30 to 90 min before performing the spectrophotometric measurement, because by then the signal was constant.

Six calibration curves (2, 4, 6, 12, 16, and 20% of HbCO) prepared during a six-month period practically overlapped. Repeated assays of hemolyzed control solutions stored at −20 °C produced the following CVs: within-day (n = 20) 1.2% (13.8% HbCO), 4.1% (9.5% HbCO), and 8.9% (3.8% HbCO); day-to-day (n = 10) 2.5% (13.4% HbCO) and 11.5% (1.9% HbCO). Through the described procedure the percentage HbCO in blood samples from smoker and non-smoker normal individuals were measured. We found smokers to have 1.8 to 10% (n = 62), non-smokers 0.2 to 2.4% (n = 105). We conclude that the non-critical reaction time proposed, avoiding the drift problems that accompany the short reaction time, can be particularly useful when many blood samples must be analyzed concurrently.

Reference

Performance of Three New Blood-Glucose Reflectometers Evaluated by Nursing and Laboratory Staffs, J.-C. Forest, F. Rousseau, J. Talbot, P. Dowille, R. Gauvin, and M. Gosselin (Services of Biochem. Hôpital Saint-François d'Assise and l'Hôtel-Dieu de Québec, Québec, Canada. Address for correspondence: Dr J.-C. Forest, Research Centre, Hôpital Saint-François d'Assise, Québec, Canada, G1L 3L5)

Several recent studies demonstrate the reliability of various chemical strips and reflectometers for estimating blood glucose in the laboratory settings (1–3). When these instruments are used outside the laboratory, their results may vary more than in the laboratory (4–6). Any evaluation of the performance of these glucose meters must therefore take into account the particular conditions in which they are utilized.

Here, three reflectometers and their reagent strips for blood glucose (Accuchek II, Boehringer Mannheim Canada, Montreal; Glucometer II, Ames, Miles Laboratories Ltd., Oshawa; Glucoscan 3000, Lifescan Inc., Vancouver) were evaluated separately in one hospital ward by well-trained nurses and in the laboratory by the technical staff. Single-user and multiple-users imprecision was assessed by assay of stabilized blood pools containing three concentrations of glucose. The three instruments had similar imprecision,
with CV 9.5% for single users (n = 10 consecutive determinations of each pool) and 12.2% for multiple users (n = 11 each).

Accuracy was evaluated by comparing results obtained by the two groups of analysts and those measured on paired samples with the laboratory analyzer (Hitachi 705, glucose oxidase; Boehringer Mannheim Canada, Montreal). The technologists' results with the reflectometers for heparinized arterial blood and those determined for plasma from the same specimens were related as follows for each reflectometer and the laboratory instrument (LI):

\[
\begin{align*}
\text{Accuchek} & : 0.86 \text{ LI } + 0.8, r = 0.98, S_{yx} = 0.5 \text{ mmol/L}, n = 65 \\
\text{Glucometer} & : 0.97 \text{ LI } + 0.85, r = 0.95, S_{yx} = 1.1 \text{ mmol/L}, n = 92 \\
\text{Glucoscan} & : 1.03 \text{ LI } + 0.01, r = 0.95, S_{yx} = 1.0 \text{ mmol/L}, n = 63
\end{align*}
\]

The relation between bedside estimation of glucose with the reflectometer and serum glucose analysis with the laboratory instrument, for paired capillary-blood specimens, gave the following regression equations:

\[
\begin{align*}
\text{Accuchek} & : 0.83 \text{ LI } + 0.8, r = 0.96, S_{yx} = 1.2 \text{ mmol/L}, n = 169 \\
\text{Glucometer} & : 0.89 \text{ LI } + 0.08, r = 0.97, S_{yx} = 1.3 \text{ mmol/L}, n = 84 \\
\text{Glucoscan} & : 0.98 \text{ LI } + 1.3, r = 0.90, S_{yx} = 1.9 \text{ mmol/L}, n = 211
\end{align*}
\]

The coefficients of correlation (r) obtained by the trained nurses were similar to those obtained by the technologists in the laboratory, but random error, as measured by $S_{yx}$, was greater when nurses were performing the analyses, showing the importance of evaluating off-site testing instruments with the personnel who are to use these instruments. We found all these instruments to be acceptable for use outside the laboratory by well-trained non-laboratory personnel. The nursing staff preferred the reflectometers with a shorter incubation time.

References