

## Determination of Hematocrit Interference in Blood Samples Derived from Patients with Different Blood Glucose Concentrations

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### Abstract

#### Background:

We performed a blood glucose meter hematocrit (HCT) interference test with lower sample manipulation requirements by using blood samples from patients with different blood glucose (BG) levels.

#### Methods:

Blood from five patients with different BG levels (2.8, 5.6, 8.3, 13.9, 19.4 mmol/liter) was manipulated to contain five different HCT concentrations (35/40/45/50/55%). Each sample was measured three times in parallel with 14 BG testing devices (reference method: YSI 2300 STAT Plus™ Glucose Analyzer). The largest mean deviations in both directions from the reference method (normalized to 100% at 45% HCT) were added as a measure for hematocrit interference factor (HIF). A HIF >10% was considered to represent clinically relevant HCT interference.

#### Results:

Few devices showed no clinically relevant HCT interference at high/low BG levels: BGStar® (7.2%, 7.3%), iBGStar® (9.0%, 8.6%), Contour® (10.0%, 4.6%), OneTouch® Verio™ 2 (10.0%, 5.2%), and GlucoMen® LX (7.2%, 5.1%). Other devices showed interference at one or both glucose ranges: ACCU-CHEK® Aviva (12.6%, 10.7%), Aviva Nano (7.2%, 10.5%), Breeze2 (3.6%, 30.2%), GlucoCard G+ (12.6%, 7.0%), OneTouch® Ultra®2 (12.6%, 25.6%), FreeStyle Freedom Lite® (9.0%, 11.0%), Precision Xceed (16.2%, 15.3%), and MediTouch® (19.8%, 28.0%). The deviations in all devices were less pronounced in the HCT range of 35–50%.

#### Conclusions:

The results of this trial with less sample manipulation (HCT only) confirmed previous examinations with HCT and glucose manipulation. The same devices showed HCT stability as previously observed. Artificial sample manipulation may be less crucial than expected when evaluating HCT interference.

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**Abbreviations:** (BG) blood glucose, (HCT) hematocrit, (HIF) hematocrit interference factor, (ISO) International Organization for Standardization, (MARD) mean absolute relative deviation, (SD) standard deviation

**Keywords:** blood glucose, hematocrit, interference, self-monitoring

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