

## MQ 2014-1 Comparison of glucometers using heparin whole blood

### Note:

The instrument comparison is structured as a survey. This is a sample test, not a complete evaluation.

### Introduction

Glucose self-testing devices are intended for patient's analysis of fresh capillary blood. Some of the devices are also suitable for the analysis of anticoagulated venous whole blood. Hemocue and AccuChek Inform 2 are intended exclusively for professional use.

As part of our inter-laboratory comparisons (surveys) for external quality control, plasma-based control samples (sample K1: Clinical Chemistry) are sent to our participating laboratories. Because of the occurring matrix effects, an individual target value for each glucose meter must be determined. Unfortunately, these target values do not compare well, since the properties of plasma are different than those of fresh capillary blood.

To nevertheless provide our participants with a target value that can be compared between instruments, we conduct additional comparative measurements with fresh blood in our laboratory.

### Approach

The manufacturers provide equipment and test strips. All devices were tested using the manufacturer's control solutions and passed.

We used heparin venous blood from the same donor for both samples. Sample A was used as is. In sample B, the glucose concentration was increased by addition of a 1 mol/l glucose solution. Both samples were taken approx. one hour prior to the measurements.

### Additional readings

The oxygen content of both samples was monitored using iSTAT from Axonlab.

The glucose was measured with the iSTAT, using a Glucoseoxidase (GOD) electrode.

For measuring the samples with Cobas 8000, we used the plasma after centrifugation of the sample. The Cobas 8000 Glucose-reagent works according to the hexokinase method.

The measurements with iSTAT and Cobas 8000 are traceable to NIST 965 standard solution for glucose in plasma.

	Sample A	Sample B
Glucose, Cobas 8000	4.94 mmol/L	9.57 mmol/L
Glucose, iSTAT	4.97 mmol/L	9.43 mmol/L
PO <sub>2</sub> , iSTAT	5.4 kPa	4.9 kPa

### Control samples

The manufacturer's control solutions were measured ten times.

### MQ survey specimen K1

The plasma sample for the current survey was measured with instruments that were available to participants of the survey.

### Manufacturer information

Not all devices are certified for analysis of venous blood. Please consult the list at the end of this report.

**Precision**

To stay within the QUALAB tolerance range of 10%, the % CV for glucose concentration may not exceed 5%, and is ideally lower than 3.3%.

At higher concentrations, the % CV of all 22 units were below 5%, at the lower concentration, 3 devices were slightly above the 5% limit.

Eight devices achieved the 3.3% limit with specimen 1, and 16 units with specimen 2.

In the manufacturer's control samples, 23 of 29 were below the 3.3% limit, in the MQ specimen (plasma), 19 of 20 devices fell under 3.3%.

The results were very pleasing. Individual instruments were able to measure within a range of +/- 0.2 mmol/l for all 10 samples. In these instrument, the calculation of the %CV influenced by rounding to 0.1 mmol/l.

**Accuracy**

To check the accuracy we used the following criteria:

- 3 measurements with iSTAT (GOx Elektrode)
- 3 measurements with Roche Cobas 8000 (Hexokinase)

Since we have been performing these comparison measurements, we have observed very good agreement between these two methods. With the current measurements, the values of Specimen 1 were identical, for Specimen 2 the Cobas 8000 was 0.1 mmol/l higher.

We now distinguish three groups with the instruments:

- Group 1 is approved for the analysis of venous blood according to the manufacturer's specifications
- Group 2 may be used for fresh capillary blood only, but it shows no matrix effects in our measurements
- Group 3 may be used with fresh capillary blood only and exhibits a systematic error in our measurements, which cannot be observed with analysis of capillary blood.

The mean values of Group 1 and Group 2 are consistent with the values of iSTAT and the Cobas 8000. Therefore, we used the average value of iSTAT, Cobas8000, Group1 and Group 2. For Specimen 1, this was 5.01 mmol/L, for Specimen 2 it was 9.56 mmol/L.

Ideal deviations are <4%.

In both groups, 13 out of 16 instruments of Group 1 and 2 achieved a deviation of less than 4%.

**IMPORTANT:** Group 2 instruments cannot be used with venous blood from patients. In our measurements, we can measure venous blood only because we control the oxygen content of the specimen.

In Group 3, we did not assess the accuracy of measurements with venous blood.

In addition, we compared the devices using fresh capillary blood. The deviations (Dev%) of the measured values were always <10% of the values measured with the Accu-Chek Inform 2.

	Gluc	Abw%	Gluc	Abw%	Gluc	Abw%	Gluc	Abw%	Gluc	Abw%
dynaValeo Liso	5.7	9.6	8.2	6.5	7.1	-1.4	6.2	-1.6	6.1	-1.6
GlucoMen Ready	5.1	-1.9	7.4	-3.9	6.7	-6.9	6	-4.8	6.2	0.0
Healthpro	5.3	1.9	8.4	9.1	7.3	1.4	6.4	1.6	6	-3.2
Glucosefino	5.5	5.8	8.4	9.1	7.8	8.3	6.3	0.0	6.3	1.6
Aviva Mobile	5.1	-1.9	7.5	-2.6	7.4	2.8	6	-4.8	6.3	1.6
Breeze 2	5.3	1.9	7.6	-1.3	7.1	-1.4	6.2	-1.6	6.3	1.6
Mittelwert	5.3		7.9		7.2		6.2		6.2	
AC Inform 2	5.2		7.7		7.2		6.3		6.2	

**Table 1: Comparison of glucometers of group 3 with fresh capillary blood.**

### Total error

Results within the QUALAB tolerance of  $\pm 10\%$  around the target value were highlighted in green.

For blood glucose monitoring systems that are used by patients themselves, the ISO 15197:2013 standard applies as of May 2013. New is that 95% of the test results must be within the  $\pm 15\%$  range. For glucose concentrations below  $<5.55$  mmol/l an absolute tolerance of  $\pm 0.83$  mmol/ must be observed.

In Specimen A, this tolerance was 4.17 to 5.83 mmol/l, in Specimen B the tolerance was 8.08 to 10.93 mmol/l

All instruments in Groups 1 and 2 were completely within the 15% range and thus conformed to the ISO 15197:2013 requirements.

The measured values of Group 3 with fresh capillary blood were all within  $\pm 10\%$  of the Accu-Chek Inform 2 values. Thus, these devices also met the QUALAB as well as the ISO requirements.

Zürich, 9.4.2014

Dr. R. Fried

Group 1	1	2	3	4	5	6	7	8	9	10	mean	Bias	CV%
Hemocue 201+	4.8	5.2	4.9	5.0	4.9	4.7	4.9	5.2	5.0	5.0	5.0	-1.19%	3.54
Hemocue 201RT	5.0	5.0	5.0	5.2	5.7	5.4	5.2	5.6	5.3	4.9	5.2	4.39%	5.18
AccuChek Inform 2	5.1	4.8	4.9	4.8	5.2	5.2	4.9	4.8	4.9	4.7	4.93	-1.60%	3.58
FreeStyle Precision	5.4	5.1	5.2	5.3	5.2	5.3	5.6	5	5.1	4.9	5.21	3.99%	3.89
Aviva	5.2	4.9	4.9	5	4.9	5	4.9	5	4.9	4.8	4.95	-1.20%	2.18
Contour XT	5.2	5.3	5.2	5.2	5.1	5.1	5.2	4.7	4.8	4.7	5.05	0.80%	4.50
Freestyle Freedom Lite	5.1	4.9	5	5.1	4.9	4.9	5.1	4.9	4.8	4.4	4.91	-2.00%	4.23
OneTouch VerioPro	5.5	5.4	5.2	5.4	5.3	5.3	5.3	5.3	5.2	5.2	5.31	5.99%	1.87
Unio	5.2	5.2	5.3	5.1	5.3	5.2	5.1	5.1	5.1	5.1	5.17	3.19%	1.59
FORA GD40a	5.4	4.9	4.9	5.3	5	4.7	4.8	5.1	5	5	5.01	0.00%	4.26
<b>Group 2 (venous blood not approved, in the experiment only small matrix effects observed)</b>													
OneTouch vita	5.5	5.2	5.2	5	5	4.9	4.9	4.9	4.9	4.9	5.04	0.60%	3.99
OneTouch UltraEasy	5.4	5	5	5	4.9	4.9	4.8	4.8	4.8	4.8	4.94	-1.40%	3.72
Glucocard Xmini plus	5.6	4.8	4.8	4.9	4.8	4.7	5	4.7	4.7	4.8	4.88	-2.59%	5.53
Glucomen LX Plus	5.2	5.2	4.9	5.1	5	4.8	5.1	5.1	5	5	5.04	0.60%	2.51
BG-Star	4.9	4.9	5.2	5.3	4.7	5.2	5.1	5.6	5.2	4.9	5.1	1.80%	5.06
PuraX	5.5	5.3	5.3	5.2	5.2	5.5	5.4	5.3	5.3	5.3	5.33	6.39%	1.99
<b>Group 3 (venous blood not approved, significant matrix effects)</b>													
dynaValeo Liso	6	5.8	5.8	5.3	5.7	5.7	5.5	5.6	5.3	5.5			4.01
Glucomen Ready	5.2	5.4	5.5	5.3	5.1	5.2	5.1	5.1	5.2	5	Accuracy		2.92
Healthpro	6.7	6.2	6.4	6.3	6	6.3	6.5	6.5	6.1	6	see		3.67
Glucosefino	6.6	6.3	6.4	6.3	6.4	5.9	6.5	6.2	6	6.2	Table 1		3.42
Aviva Mobile	5.4	5.6	5.9	5.6	5.7	5.4	5.6	5.7	5.8	5.4			3.08
Breeze 2	5.4	5.4	5.4	5.3	5.3	5.2	5.7	5.2	5.1	5.3			3.07

**Table 2: Sample A Heparine-blood, normal, postprandial.** All Glucosevalues are in mmol/l, alle instruments are plasma calibrated. Values of group 1 and 2 within the Qualab-tolerance of 10% are green colored  
Target value: 5.01 mmol/l, mean USZ (Cobas 8000): 4.94 mmol/l, mean iSTAT 4.97 mmol/l ( $PO_2 = 5.4$  kPa), Hematocrite: 0.34 l/l

<b>Group 1</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>mean</b>	<b>Bias</b>	<b>CV%</b>
Hemocue 201+	9.7	9.7	9.9	9.7	9.4	9.8	9.5	9.9	9.4	9.4	9.6	0.78%	1.78
Hemocue 201RT	9.4	10.0	9.7	10.3	9.5	9.7	9.8	9.7	9.4	9.5	9.7	1.46%	2.92
AccuChek Inform 2	9.1	9	9	9.1	8.9	9.2	8.9	9.2	8.9	8.9	9.02	-5.65%	1.36
FreeStyle Precision	9.7	9.6	9.6	10.3	9.3	10.1	10.3	10.1	10.3	9.2	9.85	3.03%	4.29
Aviva	9.2	9.4	9.3	9	9.2	9.1	9.2	9	9.4	8.9	9.17	-4.08%	1.86
Contour XT	9.1	9.8	8.7	9.3	8.5	9.4	8.9	9.2	9.7	9	9.16	-4.18%	4.49
Freestyle Freedom Lite	8.9	9.7	9.8	9.8	9.7	9.3	9.4	9.2	9.6	9.6	9.5	-0.63%	3.10
OneTouch Veriopro	9.6	9.7	9.6	9.8	9.9	9.6	9.7	9.7	9.4	9.4	9.64	0.84%	1.64
Unio	9.9	9.8	9.8	9.8	9.7	9.7	9.4	9.7	9.3	9.6	9.67	1.15%	1.95
FORA GD40a	10.2	9.4	9.6	9.8	9.5	9.8	9.4	9.4	9.6	9.8	9.65	0.94%	2.64
<b>Group 2 (venous blood not approved, in the experiment only small matrix effects observed)</b>													
OneTouch vita	10.3	10	9.7	10.2	10.1	9.9	9.8	10.1	9.8	9.8	9.97	4.29%	2.01
OneTouch UltraEasy	9.8	9.8	9.9	9.9	9.9	9.6	9.8	9.7	9.8	9.7	9.79	2.41%	1.02
GlucoCard Xmini plus	9.6	9.2	9.3	9.4	9.6	9.7	9.9	10.1	9.4	9.9	9.61	0.52%	3.04
GlucoMen LX Plus	9.3	9.2	9.3	9.8	9.4	9.3	9	9.3	9.4	9.5	9.35	-2.20%	2.21
BG-Star	10.1	9.9	10.7	9.5	9.9	10.4	9.3	9.9	9.8	9.9	9.94	3.97%	4.03
PuraX	9.8	9.6	9.9	9.7	9.7	9.5	9.7	9.4	9.4	9.7	9.64	0.84%	1.71
<b>Group 3 (venous blood not approved, significant matrix effects)</b>													
dynaValeo Liso	10.4	10.8	10.3	10.5	10	9.7	10.5	11	10.5	10.3			3.54
GlucoMen Ready	10.1	10.1	10.3	10.4	10	10.3	9.2	9.7	9.8	10.3	Accuracy		3.67
Healthpro	10.9	11	11.2	10.5	10.6	11.4	10.6	11	11.2	12	see		4.06
Glucosefino	11.3	11.6	11	10.8	11.2	10.6	11.2	11	11.3	10.7	Table 1		2.79
Aviva Mobile	11	11.2	11.2	10.9	10.9	11.7	10.9	11.2	10.4	11.2			3.02
Breeze 2	10.3	10.5	10.3	10.3	10.3	10.3	10.4	10.3	10.2	10			1.25

**Table 3: Sample B, Heparine-blood, normal with additional glucose.**

Target value: 9.56 mmol/l, mean USZ (Cobas 8000): 9.57 mmol/l, mean iSTAT 9.43 mmol/l ( $PO_2 = 4.9$  kPa), Hematocrite: 0.34 l/l

	from	to	target	1	2	3	4	5	6	7	8	9	10	mean	Bias	CV%
Hemocue 201+	1.9	3.5	2.7	2.6	2.4	2.6	2.5	2.4	2.5	2.7	2.3	2.5	2.6	2.51	-7.04	4.77
	5	6.8	5.9	5.5	5.6	5.6	5.5	5.7	5.7	5.6	5.9	5.7	5.7	5.65	-4.24	2.09
Hemocue 201RT	2.3	3.9	3.1	2.9	2.8	2.8	2.9	2.9	2.9	2.8	2.9	2.8	2.8	2.85	-8.06	1.85
	5.4	7.2	6.3	5.9	5.8	6	6.1	5.9	5.9	6.2	6.2	6.1	6	6.01	-4.60	2.28
Aviva	1.7	3.3	2.5	2.6	2.6	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.5	2.46	-1.60	3.43
	14.1	19.1	16.6	15.9	16.2	16.4	16.9	16.6	16.9	17	16.6	16.5	17.3	16.63	0.18	2.47
Aviva Mobile	2.6	4.3	3.45	3.5	3.6	3.3	3.3	3.6	3.8	3.8	3.4	3.4	3.2	3.49	1.16	5.96
	8.1	11	9.55	9.8	10	9.7	9.8	9.3	8.9	10.7	9.8	9.4	9.8	9.72	1.78	4.87
AccuChek Inform 2	1.7	3.3	2.5	2.4	2.4	2.4	2.4	2.5	2.4	2.3	2.4	2.4	2.4	2.40	-4.00	1.96
	14.5	19.6	17.05	16.4	16.7	16.6	16.4	16.5	16.5	16.2	16.6	16.3	16.4	16.46	-3.46	0.91
Contour XT	6.5	8.2	7.35	7.3	7.3	7.3	7.3	7.1	6.8	7.1	7	6.8	6.9	7.09	-3.54	2.93
Breeze 2	5.4	7.4	6.4	6.4	6.2	6.4	6.4	6.6	6.4	6.2	6.3	6.3	6.2	6.34	-0.94	2.00
Freestyle Freedom Lite	1.7	3.3	2.5	2.6	2.4	2.6	2.4	2.5	2.4	2.5	2.6	2.5	2.5	2.50	0.00	3.27
	13.8	20.7	17.25	16.3	16.2	16.1	16.4	16.3	16.3	17	16.4	17	16.8	16.48	-4.46	2.00
FreeStyle Precision	12	20.3	16.15	15.6	16.2	15.4	14.8	16.4	14.7	15.3	15.6	16.2	16	15.62	-3.28	3.75
OneTouch vita	6.5	8.7	7.6	7.5	7.6	7.2	7.4	7.5	7.4	7.4	7.6	7.4	7.4	7.44	-2.11	1.58
OneTouch UltraEasy	5.9	7.9	6.9	6.3	6.5	6.3	6.4	6.3	6.4	6.4	6.4	6.6	6.5	6.41	-7.10	1.55
OneTouch Veriopro	5.7	7.7	6.7	7.1	6.9	7	7	6.9	7	7.1	7	6.9	7	6.99	4.33	1.06
GlucoCard Xmini plus	4.9	6.3	5.6	5.3	5.5	5.2	5.2	5.5	5.6	5.3	5.1	5.3	5.4	5.34	-4.64	2.95
	9.8	12.7	11.25	11.3	11.7	10.8	11	10.7	10.4	10.7	10.5	10.8	11	10.89	-3.20	3.53

**Tabelle 4a Control solution of manufacturer**

	from	to	target	1	2	3	4	5	6	7	8	9	10	mean	Bias	CV%
dynaValeo Liso	4.3	7.7	6	6	6	5.8	6	6.5	6	6.1	6.2	6.1	5.9	6.06	1.00	3.13
GlucoMen LX Plus	5.6	7.5	6.55	6.7	6.5	6.5	6.4	6.4	6.6	6.4	6.6	6.7	6.6	6.54	-0.15	1.79
	15.1	20.3	17.7	17.3	17.2	16.7	17.1	17.1	17.9	17.3	16.4	17	16.5	17.05	-3.67	2.57
PuraX	4.5	6.1	5.3	5.4	5.6	5.6	5.3	5.6	5.6	5.3	5.6	5.6	5.6	5.52	4.15	2.39
Unio	5.3	7.2	6.25	6.3	6.5	6.3	6.4	6.3	6.2	6.4	6.4	6.3	6.4	6.35	1.60	1.34
Healthpro	4.21	6.3	5.255	5.2	5.4	5.3	5.3	5.4	5.5	5.2	5	5.1	5	5.24	-0.29	3.27
BG-Star	5.7	8.6	7.15	7.1	6.9	6.7	6.7	6.8	6.9	6.9	6.6	6.9	7	6.85	-4.20	2.20
Glucosefino	5	6.2	5.6	5.3	5.5	5.5	5.3	5.3	5.3	5.3	5.2	5.2	5.2	5.31	-5.18	2.07
	13	16.2	14.6	14.3	14.6	14.4	14.6	14.2	14	13.9	14.1	13.6	13.7	14.14	-3.15	2.45

**Table 4b Control solution of manufacturer**

	Target										Mean	CV%	Bias %	
Hemocue 201+ PL	10	9.79	9.9	10.01	10.12	10.01	9.79	9.9	10.12	9.79	9.9	9.93	1.28	-0.67
Hemocue 201RT	9.9	9.6	9.9	9.6	9.4	9.8	9.6	9.5	9.9	10.1	9.8	9.72	2.21	-1.818
Aviva	8.7	8.8	9	8.9	8.9	9	8.9	8.8	8.9	9.2	9	8.94	1.31	2.7586
Aviva Mobile	10.5	12.3	12.4	12.7	14.2	12	12.7	13.2	14.5	12.4	12	12.84	6.80	22.286
AccuChek Inform 2	8.9	8.7	8.8	8.8	8.9	8.9	8.8	8.9	8.9	8.9	9	8.86	0.95	-0.449
Contour XT	9	9.3	9.1	9	9.1	9.1	9	9	9.2	9.2	9	9.10	1.16	1.1111
Breeze 2	14	16.3	15.7	15.9	15.4	15.5	15.7	16	15.7	15.4	16.8	15.84	2.76	13.143
Freestyle Freedom Lite	9.5	9.1	9.4	9.2	9.1	9.3	9.6	9.4	9.6	9.4	9.1	9.32	2.07	-1.895
FreeStyle Precision	9.2	10.6	11	10.7	10	10.5	10.2	10.3	10.2	10.2	10.6	10.43	2.90	13.37
OneTouch vita	*	14.2	13.7	13.8	13.7	14	13.9	13.6	13.4	13.6	13.9	13.78	1.67	
OneTouch UltraEasy	12.7	12.6	12.8	12.6	12.7	12.6	12.6	12.8	12.7	12.8	12.8	12.70	0.74	0
OneTouch Veriopro	8.6	8.7	8.5	8.6	8.6	8.7	8.5	8.4	8.4	8.5	8.7	8.56	1.30	-0.465
GlucoCard Xmini plus	12.9	12.3	12.2	12.2	12.1	12.2	12.1	12.3	12.2	12.2	11.9	12.17	0.90	-5.659
dynaValeo Liso	*	13.6	13.2	12.9	12.3	13.7	12.9	13.1	13.4	13.7	13.5	13.23	3.19	
PuraX	10.4	10.6	10.4	10.8	10.6	10.6	10.7	10.7	10.4	10.5	10.4	10.57	1.27	1.6346
Unio	*	10.2	10.1	10.1	10.1	10.3	10.2	10.2	10.1	10.1	10.1	10.15	0.66	
Healthpro	15	15.1	14.7	15.5	15.6	14.9	15.1	15.5	15.3	15.4	15.4	15.25	1.81	1.6667
BG-Star	11.5	11.6	11.8	11.3	11.7	11.9	11.9	12.1	11.4	11.6	11.7	11.70	1.95	1.7391
Glukoefino	*	14.8	15.4	15.3	15.5	15.3	15.9	15.4	15.4	15.3	15.4	15.37	1.65	
FORA GD40a	*	8.1	8.1	8	8	7.8	7.7	8.2	7.8	7.8	7.6	7.91	2.36	

**Table 5: Survey Sample MQ 2014-1 K1 (Plasma-sample).** The target value for the hexokinase method on Cobas instruments was 8.9 mmol/l. None of the listed instruments is approved for the analysis of plasma glucose. The systems respond quite differently to plasma, depending on the type of electrode and hematocrit compensation. Therefore, a separate target value is calculated in the survey for each system.

\* Not enough participants at the MQ-surveys for this instrument. It was not possible to calculate a consensus value as target.



Instrument	Company	Samp.	Ac	Enzyme	Meas	Cal.	Hc%	Precision				
								1	2	3	4	5
Hemocue 201+	Hemocue	KVAN	HEF	GDH-NAD	AF	ID-GCMS			3.5	2.6	1.9	1.6
Hemocue 201RT	Hemocue	KVAN	HEF	GDH-NAD	AF	ID-GCMS	2.4		1.3			1.3
AccuChek Mobile	Roche	K		mGDH-PQQ	RF	HK	25-55	6.5	2.6	2.4	2.0	1.9
AccuChek Inform 2	Roche	KVAN	HEF	mGDH-PQQ	A	HK	10-65	4.0	4.1	3.3	3.3	3.2
AccuChek Aviva	Roche	KVAN	HE	mGDH-PQQ	A	HK	20-70	3.6	3.3	3.3	3.4	3.4
Contour XT	Bayer	KVN	H	GDH-FAD	A	YSI	0-70	1.8	1.9	1.3	1.2	1.7
Breeze	Bayer	K		GOx	A	YSI	20-55		4.1	2.3	2.1	1.9
Freestyle Freedom Lite	Abbott	KV	H	GDH	C	YSI	15-65	3.3	2.4	2.2	2.3	2.4
Freestyle Precision	Abbott	KVAN	HE	GDH-NAD	A	YSI	30-60		4	3	2.7	3.2
OneTouch vita	Lifescan	K	H	GOx	A	YSI	30-55	3.5	1.7	1.9	1.3	1.5
OneTouch UltraEasy	Lifescan	K	H	GOx	A	YSI	30-55	3.2	2.0	2.1	1.8	1.6
OneTouch Verio pro	Lifescan	KV	HEC	FAD-GDH	A	YSI	20-60	2.2	2.0	1.9	1.9	1.9
GlucoCard Xmini plus	Axonlab	K		GDH	A	YSI	30-52	2.8	2.8	2.9	3.0	2.6
DynaValeo Liso	dynamicare	K		GOx	A	YSI	35-55	4.7	3.2	3.3	2.4	2.1
GlucoMen LX Plus	Menarini	K	H	GO-FAD	A	YSI	25-60	2.6	3.6	1.9	1.7	3.0
GlucoMen Ready	Menarini	K		GOx	A	YSI	20-60	5.5	3.3	3.4	3.4	3.2
PuraX	Ypsomed	K		GOx	A	HK	30-60	1.8	1.1	1.1	1.7	1.7
Unio	Ypsomed	KV	HE	GDH-FAD	A	HK	10-70	3.8	1.8	1.7	1.6	1.7
Healthpro X1	Axapharm	K	E	GOx	A	HK	20-60	3.6	2.9	2.5	3.2	2.5
BG-Star	Sanofi	K		GOx	A	YSI	20-60	4.3	3.6	3.4	3.1	3.8
Glucosefine	Belonga	K		GOx	A	HK	20-60	4.0	2.8	2.2	2.8	2.7
FORA GD40a	FORA	KV	H	GDH-FAD	A	YSI	0-70	8.4	3.4	3.1	4.3	2.4

**Table 6: Manufacturer informations on the instruments**

Sample: K=capillary blood, V=venous blood, A=arteriel blood, N=neonatal blood

Anticoagulans (Ac): H=Heparin, E=EDTA, C=Citrate, F=Fluoride

Enzyme: GDH=Glukosedehydrogenase, GOx=Glukoseoxidase

Method: A=Amperometry, C=Coulometry, RF=Reflection-photometry, AF=Absorption-photometry

Calibration: HK=wet chemistry, with Hexokinase-Method, YSI=instrument with Glucoseoxidase-Electrode

HK: Hämatocrit-range

Precision after ISO15197 (concentrations: 1: 1.7-2.8 mmol/L; 2: 2.9-6.1 mmol/L; 3: 6.2-8.3 mmol/L; 4: 8.4-13.9 mmol/L; 5: 14.0-22.2 mmol/L)

Alle data in table 5 are from the package inserts of the teststrips or from additional documents of the manufactures.

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