

ABX Pentra Glucose HK CP

■ Pentra C200

REF	A11A01667
REAGENT 1	56 mL
REAGENT 2	14 mL



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Diagnostic reagent for quantitative *in vitro* determination of Glucose by hexokinase method in serum, plasma and urine by colorimetry.

Application Release ^a

Serum, plasma: GLUHK

01.xx

Urine: GLUHK

01.xx

Intended Use ^a

ABX Pentra Glucose HK CP reagent is intended for the quantitative *in vitro* diagnostic determination of glucose in human serum, plasma and urine using glucose hexokinase method by colorimetry. Glucose measurements are used in the diagnosis and treatment of carbohydrate metabolism disorders including diabetes mellitus, neonatal hypoglycemia, and idiopathic hypoglycemia, and of pancreatic islet cell carcinoma.

Clinical Interest (1)

Glucose is the main source of energy for human body. Glucose of food origin is converted either in glycogen in order to be stocked in liver, or in triglycerides in order to be stocked in the adipose tissues. The level of blood glucose is regulated by the effect of different hormones for which two antagonist ones are insulin and glucagon. Under physiological conditions, glucose is not excreted in the urine.

The blood sugar dosage is used to diagnostic affections of the carbohydrate metabolism as diabetes, neonatal or idiopathic hypoglycaemia and pancreatic pathologies.

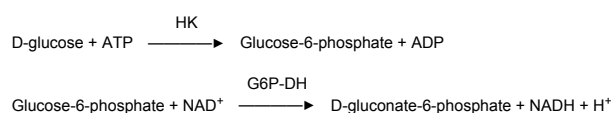
The main physiological troubles are linked with the appearance of hyperglycaemia (type I mellitus diabetes and type II mellitus diabetes).

The type I diabetes is insulin-dependent and appears principally before 30 years. The type II diabetes is non insulin-dependent, and appears often after 40 years. However, it could appear earlier among obese subjects. Other diabetes types come of secondary origin and appear following endocrinal or hepatic diseases.

Method (1)

Enzymatic method (Hexokinase).

Determination of glucose using the following reactions:



(HK = Hexokinase, G6P-DH = Glucose-6-phosphate dehydrogenase)

Reagents

ABX Pentra Glucose HK CP is ready-to-use.

Reagent 1:

Pipes Buffer, pH 7.60	100 mmol/L
NAD ⁺	3.8 mmol/L
ATP	2.2 mmol/L
Sodium azide	< 0.1%

Reagent 2:

Hexokinase	≥ 8500 U/L
G-6-PDH	≥ 8500 U/L

^aModification: chapter added.

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Reagent 2:

Magnesium sulphate	20 mmol/L
Sodium azide	< 0.1%

ABX Pentra Glucose HK CP should be used according to this notice. The manufacturer cannot guarantee its performance if used otherwise.

Handling

1. Remove both caps of the cassette.
2. If present, remove foam by using a plastic pipette.
3. Place the cassette into the refrigerated reagent compartment.

Calibrator

For calibration, use:

ABX Pentra Multical (A11A01652) (not included)
10 x 3 mL (lyophilisate)

Control ^b

For internal quality control, use:

- **ABX Pentra N Control / ABX Pentra N MultiControl** (A11A01653 / 1300054414) (not included)
10 x 5 mL (lyophilisate)
- **ABX Pentra P Control / ABX Pentra P MultiControl** (A11A01654 / 1300054415) (not included)
10 x 5 mL (lyophilisate)
- **ABX Pentra Urine Control L/H / Yumizen C Urine Level 1 Control** (A11A01674 / 1300023946) (not included)
1 x 10 mL + 1 x 10 mL / 6 x 5 mL
- **Yumizen C Urine Level 2 Control** (1300023947) (not included)
6 x 5 mL

Each control should be assayed daily and/or after a calibration.

The frequency of controls and the confidence intervals should correspond to laboratory guidelines and country-specific directives. You should follow federal, state and local guidelines for testing quality control materials. The results must be within the range of the defined confidence limits. Each laboratory should establish a procedure to follow if the results exceed these confidence limits.

Materials Required but not Provided ^b

- Automated clinical chemistry analyzer: Pentra C200
- Calibrator: **ABX Pentra Multical** (A11A01652)
- Controls:
 - ABX Pentra N Control / ABX Pentra N MultiControl** (A11A01653 / 1300054414)
 - ABX Pentra P Control / ABX Pentra P MultiControl** (A11A01654 / 1300054415)
 - ABX Pentra Urine Control L/H / Yumizen C Urine Level 1 Control** (A11A01674 / 1300023946)
 - Yumizen C Urine Level 2 Control** (1300023947)
- Standard laboratory equipment.

Specimen (2, 3)

- Serum.
- Plasma in lithium heparin.
- Plasma in oxalate fluoride.
- Urine.

Anticoagulants other than those listed have not been tested by HORIBA Medical and are therefore not recommended for use with this assay.

Stability:

The stability of glucose in specimen depends on the storage temperature, bacterial contamination and glycolysis.

Serum, plasma:

In separated, non-haemolysed sterile serum (2):

- At 25°C: 8 hours
- At 4°C: 72 hours

The plasma or serum specimen without preservative should be separated from cells or blood clot in the half hour following the taking.

In the uncentrifuged blood, at room temperature, the average decrease of glucose in serum is about 7% per hour (0.28 to 0.56 mmol/L or 5 to 10 mg/dL). This decrease results from glycolysis.

Urine:

For 24-hours collection urine, 5 mL of glacial acetic acid may be added to the container before starting the collection. Without preservatives, loss of glucose can be -40% after 24 hours at room temperature (3).

^bModification: new control.

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Reference Range

Each laboratory should establish its own reference ranges. The values given here are used as guidelines only.

Serum, plasma (4):

0.70 - 1.15 g/L
70 - 115 mg/dL
3.89 - 6.39 mmol/L

Urine (5, 6):

< 0.84 mmol/L (< 15 mg/dL)
< 2.8 mmol/24 hours (0.5 g/24 hours)

Storage and Stability

Stability before opening:

Stable up to the expiry date on the label if stored at 2-8°C.

Stability after opening:

Refer to the paragraph "Performance on Pentra C200".

Waste Management

- Please refer to local legal requirements.
- This reagent contains less than 0.1% of sodium azide as a preservative. Sodium azide may react with lead and copper to form explosive metal azides.

General Precautions °

- This reagent is for professional *in vitro* diagnostic use only.
- For prescription use only.
- This reagent is classified as non-hazardous in compliance with regulation (EC) N°.1272/2008.
- **Reagent 2 (R2):**
Warning: This reagent is obtained from substances of animal origin. Consequently, it should be treated as potentially infectious and handled with the appropriate cautions in accordance with good laboratory practices (7).
- Do not pipette by mouth.
- Do not replenish the reagents.

- Do not swallow. Avoid contact with skin and mucous membranes.
- Observe the standard laboratory precautions for use.
- The reagent cassettes are disposable and should be disposed of in accordance with the local legal requirements.
- Please refer to the SDS associated with the reagent.
- Do not use the product if there is visible evidence of biological, chemical or physical deterioration.
- It is the user's responsibility to verify that this document is applicable to the reagent used.

Performance on Pentra C200

Serum, plasma

The performance data listed below have been obtained on the Pentra C200 analyzer.

Number of tests: approximately 193 tests

On Board Reagent Stability

Once opened, the reagent cassette placed in the refrigerated Pentra C200 compartment is stable for 39 days.

Sample volume: 2 µL/test

Limit of Quantitation

The limit of quantitation is determined according to CLSI (NCCLS), EP17-A protocol (8) and equals 0.27 mmol/L (5 mg/dL).

Accuracy and Precision

Repeatability (within-run precision)

Repeatability according to the recommendations found in the Valtec protocol (9) with samples tested 20 times:

- 2 controls
- 3 specimens (low / medium / high levels)

	Mean value mmol/L	Mean value mg/dL	CV %
Control specimen 1	5.03	91	0.76
Control specimen 2	13.53	244	0.75
Specimen 1	2.24	40	1.81

°Modification: general precautions modification.

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	Mean value mmol/L	Mean value mg/dL	CV %
Specimen 2	4.87	88	0.51
Specimen 3	17.44	314	0.61

Reproducibility (total precision)

Reproducibility according to the recommendations found in the CLSI (NCCLS), EP5-A2 protocol (10) with samples tested in duplicate for 20 days (2 series per day):

- 2 controls
- 3 specimens (low / medium / high levels)

	Mean value mmol/L	Mean value mg/dL	CV %
Control specimen 1	5.16	93	1.99
Control specimen 2	13.67	246	1.60
Specimen 1	2.28	41	1.81
Specimen 2	4.77	86	1.58
Specimen 3	16.89	304	1.40

Measuring Range

The assay confirmed a measuring range from 0.27 mmol/L (5.0 mg/dL) to 50.00 mmol/L (900.0 mg/dL). The measuring range is extended up to 150.00 mmol/L (2700.0 mg/dL) with the automatic post-dilution.

Correlation

Patient samples: Serum

Number of patient samples: 103

Specimens are correlated with a commercial reagent taken as reference according to the recommendations found in the CLSI (NCCLS), EP9-A2 protocol (11).

Values ranged from 0.39 mmol/L (7.0 mg/dL) to 45.64 mmol/L (821.5 mg/dL).

The equation for the allometric line obtained using Deming regression procedure (12) is:

$$Y = 0.98 X + 0.25 \text{ (mmol/L)}$$

$$Y = 0.98 X + 4.46 \text{ (mg/dL)}$$

with a correlation coefficient $r^2 = 0.998$.

Interferences^d

Haemoglobin: No significant influence is observed up to 350 µmol/L (603 mg/dL).

Triglycerides: No significant influence is observed up to a triglyceride concentration of 16.5 mmol/L.

Total Bilirubin: No significant influence is observed up to 417 µmol/L (24.4 mg/dL).

Direct Bilirubin: No significant influence is observed up to 643 µmol/L (37.6 mg/dL).

Acetylsalicylic Acid: No significant influence is observed up to 3.62 mmol/L.

Total Proteins: No significant influence is observed up to 120 g/L.

Bicarbonate: No significant influence is observed up to 40 mmol/L.

Other limitations are given by Young as a list of drugs and preanalytical variables known to affect this methodology (13, 14).

Calibration Stability

The reagent is calibrated on Day 0. The calibration stability is checked by testing 2 control specimens.

The calibration stability is 20 days.

Note: A recalibration is recommended when reagent lots change, and when quality control results fall outside the range established.

Conversion Factor

$$\text{mmol/L} \times 0.18 = \text{g/L}$$

$$\text{mmol/L} \times 18 = \text{mg/dL}$$

Urine

The performance data listed below have been obtained on the Pentra C200 analyzer.

Number of tests: approximately 193 tests

On Board Reagent Stability

Once opened, the reagent cassette placed in the refrigerated Pentra C200 compartment is stable for 39 days.

Sample volume: 3 µL/test

Limit of Quantitation

The limit of quantitation is determined according to CLSI (NCCLS), EP17-A protocol (8) and equals 0.04 mmol/L (0.72 mg/dL).

^dModification: modification of interferences.

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Accuracy and Precision

Repeatability (within-run precision)

Repeatability according to the recommendations found in the Valtec protocol (9) with samples tested 20 times:

- 2 controls
- 4 specimens (low / medium / high levels)

	Mean value mmol/L	Mean value mg/dL	CV %
Control specimen 1	1.68	30.3	2.00
Control specimen 2	17.07	307.2	1.93
Specimen 1	0.75	13.4	1.77
Specimen 2	1.69	30.4	1.90
Specimen 3	8.43	151.7	2.22
Specimen 4	27.99	503.8	2.73

Reproducibility (total precision)

Reproducibility according to the recommendations found in the CLSI (NCCLS), EP5-A2 protocol (10) with samples tested in duplicate for 20 days (2 series per day):

- 2 controls
- 3 specimens (low / medium / high levels)

	Mean value mmol/L	Mean value mg/dL	CV %
Control specimen 1	1.69	30.3	4.15
Control specimen 2	16.23	292.1	3.42
Specimen 1	1.74	31.3	3.42
Specimen 2	8.81	158.5	3.58
Specimen 3	28.73	517.2	3.27

Measuring Range

The assay confirmed a measuring range from 0.04 mmol/L (0.72 mg/dL) to 30.00 mmol/L (540 mg/dL). The measuring range is extended up to 150.00 mmol/L (2700.0 mg/dL) with the automatic post-dilution. The reagent linearity has been assessed up to 30.00 mmol/L (540.0 mg/dL) according to the recommendations found in the CLSI (NCCLS), EP6-A protocol (15).

Correlation

Patient samples: urine
Number of patient samples: 96

Specimens are correlated with a commercial reagent taken as reference according to the recommendations found in the CLSI (NCCLS), EP9-A2 protocol (11).

Values ranged from 0.23 mmol/L (4.1 mg/dL) to 29.15 mmol/L (524.6 mg/dL).

The equation for the allometric line obtained using Passing-Bablok regression procedure (16) is:

$$Y = 1.01 X - 0.01 \text{ (mmol/L)}$$

$$Y = 1.01 X - 0.17 \text{ (mg/dL)}$$

with a correlation coefficient $r^2 = 0.9962$.

Interferences

Haemoglobin: No significant influence is observed up to 350 µmol/L (603 mg/dL).

Lipemia: No significant influence is observed up to an Intralipid® concentration (representative of lipemia) of 0.2%.

Direct Bilirubin: No significant influence is observed up to 350 µmol/L (20.5 mg/dL).

Ascorbic Acid: No significant influence is observed up to 3.4 mmol/L (59.9 mg/dL).

Other limitations are given by Young as a list of drugs and preanalytical variables known to affect this methodology (13, 14).

Calibration Stability

The reagent is calibrated on Day 0. The calibration stability is checked by testing 2 control specimens.

The calibration stability is 22 days.

Note: A recalibration is recommended when reagent lots change, and when quality control results fall outside the range established.

Conversion Factor:

$$\text{mmol/L} \times 0.18 = \text{g/L}$$

$$\text{mmol/L} \times 18 = \text{mg/dL}$$

Reference

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