Clinical Chemistry

2023/09/04
A93A01321FUS

ABX Pentra CK NAC CP

REF A11A01632
REAGENT 1 26 mL
REAGENT 2 6.5 mL

IVD CE Rx Only

- Pentra C400

HORIBA ABX SAS
Parc Euromédecine
Rue du Caducée
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34184 Montpellier Cedex 4
FRANCE

Diagnostic reagent for quantitative *in vitro* determination of Total Creatine Kinase (CK) in serum or plasma by colorimetry.

Application Release

Serum, plasma: CK

1.xx

Intended Use [a]

ABX Pentra CK NAC CP reagent is intended for the quantitative *in vitro* diagnostic determination of the total creatine kinase in human serum and plasma based on an optimized UV test. Measurements of creatine phosphokinase and its isoenzymes are used in the diagnosis and treatment of myocardial infarction and muscle diseases such as progressive, Duchenne-type muscular dystrophy.

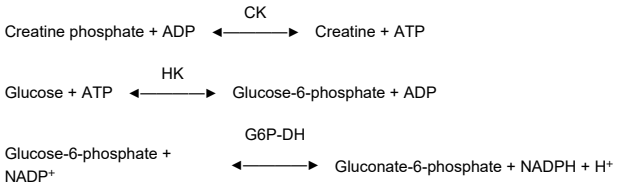
Clinical Interest (1, 2)

Creatine kinase (CK) is an enzyme which consists of isoenzymes mainly of the muscle (CK-M) and the brain (CK-B). CK exists in serum in dimeric form as CK-MM, CK-MB, CK-BB and as macroenzyme. Elevated CK values are observed in cardiac muscle damages and in skeletal muscle diseases. Measurement of CK is used especially in conjunction with CK-MB for diagnosis and monitoring of myocardial infarction.

Method (3, 4, 5, 6, 7)

History: the method for the determination of the activity of creatine kinase (CK) using a coupled enzymatic reactions was initially described by Oliver (3) and then modified by Rosalky (4).

The DGKC (German Society of Clinical Chemistry) (5) and the IFCC (International Federation of Clinical Chemistry) (6) standardized the method thereafter recommending the reversibility of the oxidation of the CK and the activation of this one by N-acetylcysteine (NAC). The IFCC confirmed this one and extended the method to 37°C in 2002 (7), which is the method used here:
Optimized UV test according to DGKC (5) and IFCC (7).



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

Reagents [b]

ABX Pentra CK NAC CP is ready-to-use.

Reagent 1 (R1):	
Imidazole pH 6.0	60 mmol/L
Glucose	27 mmol/L
N-Acetylcysteine (NAC)	27 mmol/L
Magnesium acetate	14 mmol/L
EDTA-Na_2	2 mmol/L
NADP	2.7 mmol/L
Hexokinase (HK)	≥ 5 kU/L

[a]Modification: new leaflet form.
[b]Modification: § "Reagents": modification.

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Reagent 2 (R2):	
Imidazole pH 9.0	160 mmol/L
Creatine phosphate	160 mmol/L
EDTA-Na_2	2 mmol/L
ADP	11 mmol/L
AMP	28 mmol/L
Diadenosine pentaphosphate	55 µmol/L
Glucose-6-phosphate dehydrogenase (G6P-DH)	≥ 14 kU/L

ABX Pentra CK NAC 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 Pentra C400 reagent compartment.

Calibrator

For calibration, use:
ABX Pentra Multical (A11A01652) (not included)
10 x 3 mL (lyophilisate)

Control [c]

For internal quality control, use:

- **ABX Pentra N MultiControl** (1300054414) (not included)
  10 x 5 mL (lyophilisate)
- **ABX Pentra P MultiControl** (1300054415) (not included)
  10 x 5 mL (lyophilisate)

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 [c]

- Automated clinical chemistry analyzer: Pentra C400
- Calibrator: **ABX Pentra Multical** (A11A01652)
- Controls:
  ABX Pentra N MultiControl (1300054414)
  ABX Pentra P MultiControl (1300054415)
- Standard laboratory equipment.

Specimen [d]

This device intended testing population is general population.

- Serum.
- Plasma in lithium heparin.

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

Stability (in the dark) (8)

- At 20 - 25°C: 2 days
- At 4 - 8°C: 7 days
- At - 20°C: 4 weeks

Reference Range [e] (7)

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

Adults (7)	**37°C**
Women	≤ 145 U/L
Men	≤ 171 U/L

Clinical sensitivity and specificity, positive predictive value and negative predictive value are not commonly reported for this analyte. This is largely attributed to the fact that this analyte is not sole indicator for the intended purpose and patient treatment decision making. To arrive at a diagnosis and a course of treatment, results from others routine clinical chemistry tests should be used in conjunction with other diagnostic information and the

[c]Modification: control removed.
[d]Modification: modification of specimen stability.
[e]Modification: information added.

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attending health-care professional's evaluation of the patient's condition.

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 C400".

Do not freeze.

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 [f]

- This reagent is for professional *in vitro* diagnostic use only.
  For laboratory use.
- For prescription use only.
- This reagent is classified as hazardous in compliance with regulation (EC) N°.1272/2008.
- **Reagent 1 (R1):**
  Danger: Due to imidazole presence.
  H360D: May damage the unborn child.
  P201: Obtain special instructions before use.
  P202: Do not handle until all safety precautions have been read and understood.
  P280: Wear protective gloves/protective clothing/eye protection/face protection.
  P308 + P313: IF exposed or concerned: Get medical advice/attention.
  P405: Store locked up.
  P501: Dispose of contents and container in accordance with all local, regional, national and international regulations.
  Contains: Imidazole
- **Reagent 2 (R2):**
  Danger: Due to imidazole presence.
  H315: Causes skin irritation.
  H319: Cause serious eye irritation.
  H360D: May damage the unborn child.
  P201: Obtain special instructions before use.
  P202: Do not handle until all safety precautions have been read and understood.
  P280: Wear protective gloves/protective clothing/eye protection/face protection.
  P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
  P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P308 + P313: IF exposed or concerned: Get medical advice/attention.
  P332 + P313: If skin irritation occurs: Get medical advice/attention.
  P337 + P313: If eye irritation persists: Get medical advice/attention.
  P362 + P364: Take off contaminated clothing and wash it before reuse.
  P405: Store locked up.
  P501: Dispose of contents and container in accordance with all local, regional, national and international regulations.
  Contains: Imidazole
- **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 (9).
- 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.
- Do not use the product if the recommended storage conditions, including temperature, are not followed.
- User must be trained by a HORIBA Medical representative before attempting to operate the device.
- It is the user's responsibility to verify that this document is applicable to the reagent used.
- For technical assistance, you can call +33 (0)4 67 14 15 16.

[f]Modification: general precautions modification.

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- Any serious incident that has occurred in relation to the device shall be reported to the manufacturer and the competent authority of the country in which the user and/or the patient is established.

Performance on Pentra C400

Lot to Lot Variability [g]

The recovery of samples (serum and plasma) done during QC release of three consecutive lots of reagent shows that the lot to lot variability is within specification: < 10%.

Serum, plasma

The performance data listed below are representative of performance on HORIBA Medical Systems.

Number of tests: 125 tests
If the number of tests requested is low and the Pentra C400 user intends to utilise the cassette to the maximum on board stability, it is the recommendation of HORIBA Medical, to utilise the consumable part XEC232 (Kit membrane) to achieve the number of tests stated in this notice.

On Board Reagent Stability

Once opened, the reagent cassette placed in the refrigerated Pentra C400 compartment is stable for 64 days.

Sample volume: 8 µL/test

Detection Limit [h]

The detection limit is determined according to CLSI (NCCLS), EP17-A2 protocol (10) and equals 3.66 U/L.

Limit of Quantitation [i]

The limit of quantitation is determined according to CLSI (NCCLS), EP17-A2 protocol (10) and equals 9 U/L.

Accuracy and Precision

Repeatability (within-run precision)

Repeatability according to the recommendations found in the Valtec protocol (11) with samples tested 20 times:

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

	Mean value U/L	CV %
Control specimen 1	166	1.20
Control specimen 2	474	0.92
Specimen 1	46	2.54
Specimen 2	115	1.14
Specimen 3	347	0.79

Reproducibility (total precision)

Reproducibility according to the recommendations found in the CLSI (NCCLS), EP5-A2 protocol (12) with samples tested in duplicate for 20 days (2 series per day):

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

	Mean value U/L	CV %
Control specimen 1	162	2.56
Control specimen 2	469	2.50
Specimen 1	81	4.65
Specimen 2	311	2.61

Measuring Range [j]

The assay confirmed a measuring range from 9 U/L to 1300 U/L.
The measuring range is extended up to 3900 U/L with the automatic post-dilution.
The reagent linearity has been assessed up to 1300 U/L according to the recommendations found in the CLSI (NCCLS), EP06-Ed2 protocol (13).

Correlation [k]

Patient samples: Serum
Number of patient samples: 169
Specimens are correlated with a commercial reagent taken as reference according to the recommendations found in the CLSI (NCCLS), EP09c protocol (14).
Values ranged from 9 U/L to 1281.91 U/L.
The equation for the allometric line obtained using Passing-Bablok regression procedure (15) is:
Y = 1.039 X - 0.5092 (U/L)
with a correlation coefficient r^2 = 0.993.

[g]Modification: chapter added.
[h]Modification: modification of detection limit.
[i]Modification: data added.
[j]Modification: modification of measuring range.
[k]Modification: modification of correlation.

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Interferences [I]

Haemoglobin:	No significant influence is observed up to 56 µmol/L (97 mg/dL).
Triglycerides:	No significant influence is observed up to a triglyceride concentration of 5.48 mmol/L (479.50 mg/dL).
Total Bilirubin:	No significant influence is observed up to 125 µmol/L (7.3 mg/dL).
Direct Bilirubin:	No significant influence is observed up to 100 µmol/L (5.9 mg/dL).

Other limitations are given by Young as a list of drugs and preanalytical variables known to affect this methodology (16, 17).

Calibration Stability

The reagent is calibrated on Day 0. The calibration stability is checked by testing 2 control specimens.
The calibration stability is 8 days.
Note: A recalibration is recommended when reagent lots change, and when quality control results fall outside the range established.

Reference

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[I]Modification: modification of interferences.