

CREATININE

CR 0400 CH	4 x 100 ml
CR 1000 CH	4 x 250 ml

INTENDED USE

Reagent for quantitative in vitro determination of creatinine in biological fluids.

SUMMARY OF TEST

Between 1 and 2% of muscle creatine is converted to creatinine daily. Because the amount of endogenous creatinine produced is proportional to muscle mass, the production varies with age and sex. Because creatinine is endogenously produced and released into body fluids at a constant rate and its plasma levels maintained within narrow limits, its clearance may be measured as an indicator of glomerular filtration rate (GFR).

PRINCIPLE OF THE METHOD

Creatinine reacts with picric acid in alkaline environment to form a color complex. Developing of this red color may be followed photometrically at 500-520 nm. The association on surfactant and sodium tetraborate keeps interferences at minimum.

KIT COMPONENTS

For in vitro diagnostic use only.

The components of the kit are stable until expiration date on the label.

Keep away from direct light sources.

CREA R1 0400: 2 x 100 ml (liquid) blue cap
1000: 2 x 250 ml (liquid) blue cap

CREA R2 0400: 2 x 100 ml (liquid) red cap
1000: 2 x 250 ml (liquid) red cap

Composition in the test: picric acid 14 mM, NaOH 0.18 M, sodium tetraborate 10 mM, surfactant.

Standard: creatinine 2 mg/dl - 5 ml

Store all components at 15-25°C.

MATERIALS REQUIRED BUT NOT SUPPLIED

Current laboratory instrumentation. Spectrophotometer UV/VIS with thermostatic cuvette holder. Automatic micropipettes. Glass or high quality polystyrene cuvettes. Saline solution.

REAGENT PREPARATION

Mix 1 part of reagent R1 with 1 part of reagent R2.

Stability of working reagent: preferably within 30 days at 15-25°C, well capped and away from light sources.

Stability of unmixed reagents: up to expiration date on labels at 15-25°C;

Stability since first opening of vials of unmixed reagents: preferably within 60 days at 15-25°C.

PRECAUTIONS

CREA R1: Danger. May damage fertility. May damage the unborn child (H360FD). Causes serious eye irritation (H319). Causes skin irritation (H315).

Obtain special instructions before use (P201). Wear protective gloves/ protective clothing / eye protection / face protection (P280). IF exposed or concerned: Get medical advice / attention (P308+P313). If eye irritation persists: Get medical advice / attention (P337+P313).

Wash with water thoroughly after handling (P264).

CREA R2: It is not classified as hazardous

Standard: It is not classified as hazardous

SPECIMEN

Serum, plasma. Urine.

Creatinine is stable 24 hours at 2-8°C. Freeze samples for prolonged storage.

Dilute urine sample 1:100 with deionized water. It could be convenient a slight acidification of urine with HCl.

TEST PROCEDURE

Wavelength: 510 nm (allowed 500 ÷ 520 nm)
Lightpath: 1 cm
Temperature: 37°C

dispense:	blank	standard	sample
working reagent	1 ml	1 ml	1 ml

incubate at 37°C for 5 minutes

water	100 µl	-	-
standard	-	100 µl	-
sample	-	-	100 µl

Mix, incubate 60 seconds at 37°C, then record absorbance as A₁. After exactly 60 seconds, record again absorbance as A₂.

RESULTS CALCULATION

Serum/plasma sample:

$$\text{creatinine mg/dl} = \frac{A_2 - A_1 (\text{sample})}{A_2 - A_1 (\text{standard})} \times 2 (\text{standard value})$$

Random urine sample:

$$\text{creatinine mg/dl} = \frac{A_2 - A_1 (\text{sample})}{A_2 - A_1 (\text{standard})} \times 2 \times 100$$

(standard value and dilution)

24 hours urine sample (creatinine mg/24h):

$$[A_2 - A_1 (\text{sample})] / [A_2 - A_1 (\text{standard})] \times 2 \times 100 \times \text{urine volume}$$

(standard value, dilution factor and diuresis in decilitres)

EXPECTED VALUES

Serum/plasma samples:

Men: 0.7 - 1.2 mg/dl (62 - 105 µmol/l)
Women: 0.6 - 1.1 mg/dl (53 - 97 µmol/l)

24h urine:

Men: 1000 - 2000 mg/24h (8.85 - 17.70 mmol/24h)
Women: 800 - 1800 mg/24h (7.08 - 15.93 mmol/24h)

Each laboratory should establish appropriate reference intervals related to its population.

QUALITY CONTROL AND CALIBRATION

It is suggested to perform an internal quality control. For this purpose the following human based control sera are available:

QUANTINORM CHEMA - MULTINORM CHEMA

with normal or close to normal control values

QUANTIPATH CHEMA - MULTIPATH CHEMA

with pathological control values.

If required, a multiparametric, human based calibrator is available:

AUTOCAL H

Please contact Customer Care for further information.

TEST PERFORMANCE

Linearity

the method is linear up to 20 mg/dl.

If the value is exceeded, it is suggested to dilute sample 1+9 with saline and to repeat the test, multiplying the result by 10.

Sensitivity/limit of detection (LOD)

the limit of detection is 0.2 mg/dl.

Interferences

no interference was observed by the presence of:

hemoglobin ≤ 500 mg/dl
lipids ≤ 1250 mg/dl

Bilirubins give interference at low levels.

Precision

intra-assay (n=10)	mean (mg/dl)	SD (mg/dl)	CV%
sample 1	1.25	0.03	2.60
sample 2	3.87	0.07	1.90

inter-assay (n=20)	mean (mg/dl)	SD (mg/dl)	CV%
sample 1	1.31	0.04	2.90
sample 2	3.80	0.14	3.80

Methods comparison

a comparison between Chema and a commercially available product gave the following results:

Creatinine Chema = x
Creatinine competitor = y
n = 104

$$y = 0.982x - 0.081 \text{ mg/dl} \quad r^2 = 0.94$$

WASTE DISPOSAL

This product is made to be used in professional laboratories.

P501: Dispose of contents according to national/international regulations.

REFERENCES








Tietz Textbook of Clinical Chemistry, Second Edition, Burtis-Ashwood (1994).

HU Bergmeyer - Methods of enzymatic analysis, (1987).

MANUFACTURER

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SYMBOLS

	in vitro diagnostic medical device
	batch code
	catalogue number
	temperature limit
	use-by date
	caution
	consult instructions for use