

Overview

Useful For

Routine health monitoring or patient monitoring while hospitalized for information regarding metabolism, including the current kidney status, electrolyte, and acid/base balance, and blood glucose

Profile Information

Test ID	Reporting Name	Available Separately	Always Performed
KS	Potassium, S	Yes	Yes
NAS	Sodium, S	Yes	Yes
CL	Chloride, S	Yes	Yes
HCO3	Bicarbonate, S	Yes	Yes
AGAP	Anion Gap	No	Yes
BUN	Bld Urea Nitrog(BUN), S	Yes	Yes
CRTS1	Creatinine with eGFR, S	Yes	Yes
CA	Calcium, Total, S	Yes	Yes
GLURA	Glucose, Random, S	Yes	Yes

Method Name

KS, NAS, CL: Potentiometric, Indirect Ion-Selective Electrode

HCO3: Photometric/Enzymatic

AGAP: Sodium-(Bicarbonate + Chloride)

BUN: Photometric, Urease

CRTS1: Enzymatic Colorimetric Assay

CA: Photometric, 5-nitro-5'-methyl-BAPTA

GLURA: Photometric/Hexokinase

NY State Available

Yes

Specimen

Specimen Type

Serum

Shipping Instructions

Ship specimen protected from light.

Necessary Information

Patient's age and sex are required.

Specimen Required
Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Specimen Volume: 0.5 mL

Collection Instructions:

1. Serum gel tubes should be centrifuged within 2 hours of collection.
2. Red-top tubes should be centrifuged and aliquoted within 2 hours of collection.

Specimen Minimum Volume

0.4 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated	24 hours	

Clinical and Interpretive
Clinical Information

The basic metabolic panel measures 8 analytes and calculates an anion gap. It is used to assess kidney status, electrolyte, and acid/base balance, and blood glucose.

Reference Values
SODIUM

<1 year: not established

> or =1 year: 135-145 mmol/L

POTASSIUM

<1 year: not established

> or =1 year: 3.6-5.2 mmol/L

CHLORIDE

<1 year: not established

1-17 years: 102-112 mmol/L

> or =18 years: 98-107 mmol/L

BICARBONATE**Males:**

<1 year: not established

1-2 years: 17-25 mmol/L

3 years: 18-26 mmol/L

4-5 years: 19-27 mmol/L

6-7 years: 20-28 mmol/L

8-17 years: 21-29 mmol/L

> or =18 years: 22-29 mmol/L

Females:

<1 year: not established

1-3 years: 18-25 mmol/L

4-5 years: 19-26 mmol/L

6-7 years: 20-27 mmol/L

8-9 years: 21-28 mmol/L

> or =10 years: 22-29 mmol/L

ANION GAP

<7 years: not established

> or =7 years: 7-15

BLOOD UREA NITROGEN**Males:**

<12 months: not established

1-17 years: 7-20 mg/dL

> or =18 years: 8-24 mg/dL

Females:

<12 months: not established

1-17 years: 7-20 mg/dL

> or =18 years: 6-21 mg/dL

CREATININE

Males:

0-11 months: 0.17-0.42 mg/dL

1-5 years: 0.19-0.49 mg/dL

6-10 years: 0.26-0.61 mg/dL

11-14 years: 0.35-0.86 mg/dL

> or =15 years: 0.74-1.35 mg/dL

Females:

0-11 months: 0.17-0.42 mg/dL

1-5 years: 0.19-0.49 mg/dL

6-10 years: 0.26-0.61 mg/dL

11-15 years: 0.35-0.86 mg/dL

> or =16 years: 0.59-1.04 mg/dL

ESTIMATED GLOMERULAR FILTRATION RATE (eGFR)

>60 mL/min/BSA

Estimated GFR calculated using the 2009 CKD_EPI creatinine equation

CALCIUM

<1 year: 8.7-11.0 mg/dL

1-17 years: 9.3-10.6 mg/dL

18-59 years: 8.6-10.0 mg/dL

60-90 years: 8.8-10.2 mg/dL

>90 years: 8.2-9.6 mg/dL

GLUCOSE

0-11 months: not established

> or =1 year: 70-140 mg/dL

Interpretation

Basic metabolic panel results are usually evaluated in conjunction with each other for patterns of results. A single abnormal test result could be indicative of something different than if more than 1 of the test results are abnormal. Many conditions will cause abnormal results including kidney failure, breathing problems, and diabetes-related complications.

Cautions

No significant cautionary statements

Clinical Reference

1. Oh MS: Chapter 14: Evaluation of renal function, water, electrolytes, and acid-base balance. In Henry's Clinical Diagnosis and Management by Laboratory Methods. Edited by RA McPherson, MR Pincus. 22nd edition. Philadelphia, PA. Elsevier Saunders, 2011
2. Lab Tests Online. Available at <https://labtestsonline.org/understanding/analytes/bmp>

Performance

Method Description

Sodium, Potassium, Chloride:

Ion-selective electrode (ISE) (indirect potentiometry). The ISE module performs indirect measurement of electromotive force (EMF). The ISE module measures the EMF difference between an ion-selective electrode and a reference electrode. The EMF of the ion-selective electrode is dependent on the ion concentration of the sample. The EMF of the reference electrode is constant. An electronic calculation circuit converts EMF of the sample to the ion concentration of the sample. (Package insert: Roche Diagnostics ISE reagent; Indianapolis, IN, 2006)

Bicarbonate:

This is a photometric rate reaction. Bicarbonate (HCO_3^-) reacts with phosphoenolpyruvate (PEP) in the presence of phosphoenolpyruvate carboxylase (PEPC) to produce oxaloacetate and phosphate. The oxaloacetate produced is coupled with NADH in the presence of malate dehydrogenase (MDH) to produce malate and NAD. The consumption of NADH causes a decrease in absorbance and is monitored in the ultraviolet range of 320 to 400 nm. The rate of change is directly proportional to the concentration of bicarbonate. (Package insert: Roche Bicarbonate reagent, Indianapolis, IN, July 2000)

Anion Gap:

This is a calculated result. The following equation is used to calculate the anion gap (A gap):

A gap =Na - (Cl + HCO₃)

Blood Urea Nitrogen:

This is a kinetic ultraviolet assay where urease cleaves urea to form ammonia and CO₂. The ammonia formed then reacts with α-ketoglutarate and NADH in the presence of urease/glutamate dehydrogenase (GLDH) to yield glutamate and NAD. The decrease in absorbance, due to the consumption of NADH, is measured kinetically and is proportional to the amount of urea in the sample.(Package insert: Roche Urea/BUN reagent; Indianapolis, IN, Sept 2000)

Creatinine:

This enzymatic method is based on the conversion of creatinine with the aid of creatininase, creatinase, and sarcosine oxidase to glycine, formaldehyde, and hydrogen peroxide. Catalyzed by peroxidase the liberated hydrogen peroxide reacts with 4-aminophenazone and HTIB to form a quinone imine chromogen. The color intensity of the quinone imine chromogen formed is directly proportional to the creatinine concentration in the reaction mixture.(Package insert: Roche Diagnostics, Indianapolis IN, 12/2016)

Calcium:

Calcium ions react with 5-nitro-5'-methyl-BAPTA (NM-BAPTA) under alkaline conditions to form a complex. This complex reacts in the second step with EDTA. The change in absorbance is directly proportional to the calcium concentration and is measured photometrically.(Package insert: Roche Calcium Gen.2 reagent, Roche Diagnostic Corp, Indianapolis, IN, 7/2012)

Glucose:

Glucose in the serum, in the presence of hexokinase, is converted to glucose-6-phosphate (G-6-P). In the presence of NADP, oxidizes G-6-P to gluconate-6-phosphate and NADPH. The rate of NADPH formation is directly proportional to glucose concentration in the serum and is measured photometrically.(Package insert: Roche Glucose Reagent. Indianapolis, IN, January 2000)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday through Sunday; Continuously

Analytic Time

Same day/1 day

Maximum Laboratory Time

2 days

Specimen Retention Time

1 week

Performing Laboratory Location

Rochester

Fees and Codes

Fees

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact [Customer Service](#).

Test Classification

This test has been cleared, approved or is exempt by the U.S. Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

84132

84295

82435

82374

84520

82565

82310

82947

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
BMAMA	Basic Metabolic Panel, S	24321-2

Result ID	Test Result Name	Result LOINC Value
AGAP	Anion Gap	33037-3
BUN	Bld Urea Nitrog(BUN), S	3094-0
CL	Chloride, S	2075-0
GLURA	Glucose, Random, S	2345-7
HCO3	Bicarbonate, S	1963-8
CA	Calcium, Total, S	17861-6
NAS	Sodium, S	2951-2
KS	Potassium, S	2823-3
CRTSA	Creatinine, S	2160-0
EGNB	eGFR-Non Black	88294-4
EGBL	eGFR-Black	88293-6