

## Overview

### Useful For

Identifying a suspected imbalance in electrolytes or acid/base imbalance

### Method Name

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

HCO<sub>3</sub>: Photometric/Enzymatic

AGAP: Calculated Result

### NY State Available

Yes

## Specimen

### Specimen Type

Serum

### Necessary Information

Patient's age and sex are required.

### Specimen Required

#### Collection Container/Tube:

**Preferred:** Serum gel

**Acceptable:** Red top

**Submission Container/Tube:** Plastic vial

**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 the serum aliquoted into a plastic vial within 2 hours of collection.

### Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:

[-Kidney Transplant Test Request](#)

[-Renal Diagnostics Test Request](#) (T830)

### Specimen Minimum Volume

0.4 mL

### Reject Due To

Gross	Reject
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hemolysis	
Gross lipemia	OK

## Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated	24 hours	

## Clinical & Interpretive

### Clinical Information

The electrolyte panel is ordered to identify electrolyte, fluid, or pH imbalance. Electrolyte concentrations are evaluated to assist in investigating conditions that cause electrolyte imbalances such as dehydration, kidney disease, lung diseases, or heart conditions. Repeat testing of the electrolyte or its components may be used to monitor the patient's response to treatment of any condition that may be causing the electrolyte, fluid or pH imbalance.

Electrolyte and acid-base imbalances can often be indicative of many acute and chronic illnesses. For this reason, the electrolyte panel is often used in the hospital and emergency settings to evaluate patients.

### 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

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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

**Interpretation**

With an imbalance of a single electrolyte, such as sodium or potassium, repeat testing may be ordered of that particular electrolyte, can be used to monitor the imbalance until remedied. With an acid-base imbalance, blood gases may be ordered, which will measure the oxygen, carbon dioxide, and pH levels in the arterial blood. These tests assist in evaluating the acuteness of the imbalance and monitoring the response to treatment.

**Cautions**

No significant cautionary statements

**Clinical Reference**

1. Oh MS: Evaluation of renal function, water, electrolytes, and acid-base balance. In Henry's Clinical Diagnosis and Management by Laboratory Methods. 22nd edition. Edited by RA McPherson, MR Pincus. Philadelphia, PA: Elsevier Saunders; 2011:chap 14
2. AACC: Lab Tests Online: Access 03/22/2017. Available at <https://labtestsonline.org/understanding/analytes/electrolyes>

**Performance****Method Description**

Potassium; Chloride; Sodium:

The ion-selective electrode (ISE) module indirectly measures the electromotive force (EMF) difference between an ISE and a reference electrode. The EMF of the ISE 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: ISE reagent. Roche Diagnostics; V14.0, 02/2018)

Bicarbonate:

This is a photometric rate reaction. Bicarbonate ( $\text{HCO}_3^-$ ) reacts with phosphoenolpyruvate in the presence of phosphoenolpyruvate carboxylase to produce oxaloacetate and phosphate. The oxaloacetate produced is coupled with reduced nicotinamide adenine dinucleotide (NADH) in the presence of malate dehydrogenase 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: Bicarbonate reagent. Roche Diagnostics; 04/2019)

Anion Gap:

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

$$A \text{ gap} = Na - (Cl + HCO_3[-])$$

**PDF Report**

No

**Day(s) Performed**

Monday through Sunday

**Report Available**

Same day/1 to 2 days

**Specimen Retention Time**

1 week

**Performing Laboratory Location**

Mayo Clinic Laboratories - Rochester Main Campus

**Fees & 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 account representative. For assistance, contact [Customer Service](#).

**Test Classification**

This test has been cleared, approved, or is exempt by the US 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**

80051-Electrolyte Panel (if all 4 are performed)

82435-Chloride (if all 4 are not performed)

84295- Sodium (if all 4 are not performed)

84132-Potassium (if all 4 are not performed)

82374-Bicarbonate (if all 4 are not performed)

**LOINC® Information**

Test ID	Test Order Name	Order LOINC® Value
ELPSR	Electrolyte Panel, S	24326-1

Result ID	Test Result Name	Result LOINC® Value
AGAP	Anion Gap	33037-3
CL	Chloride, S	2075-0

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HCO3	Bicarbonate, S	1963-8
NAS	Sodium, S	2951-2
KS	Potassium, S	2823-3