Test Definition: RKUR

Potassium, Random, U

Overview

Useful For

Determining the cause for hyper- or hypokalemia using a random urine specimen

Method Name

Potentiometric, Indirect Ion-Selective Electrode (ISE)

NY State Available

Yes

Specimen

Specimen Type

Urine

Specimen Required

Supplies: Aliquot tube, 5 mL (T465)

Container/Tube: Plastic, 5-mL tube

Specimen Volume: 4 mL

Collection Instructions:

1. Collect a random urine specimen.

2. No preservative.

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Minimum Volume

1 mL

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container

Urine	Refrigerated (preferred)	14 days	
	Frozen	30 days	
	Ambient	7 days	

Clinical & Interpretive

Clinical Information

Potassium (K+) is the major intracellular cation. Functions of K+ include regulation of neuromuscular excitability, heart contractility, intracellular fluid volume, and hydrogen ion concentration. The physiologic function of K+ requires the body to maintain a low extracellular fluid (ECF) concentration of the cation; the intracellular K+ concentration is 20 times greater than the extracellular concentration. Only 2% of total body K+ circulates in the plasma.

The kidneys provide the most important regulation of K+. The proximal tubules reabsorb almost all the filtered K+. Under the influence of aldosterone, the remaining K+ can then be secreted into the urine in exchange for sodium in both the collecting ducts and the distal tubules. Thus, the distal nephron is the principal determinant of urinary K+ excretion.

Decreased excretion of K+ in acute kidney disease and end-stage kidney failure are common causes of prolonged hyperkalemia.

Renal losses of K+ may occur during the diuretic (recovery) phase of acute tubular necrosis, during administration of non-potassium sparing diuretic therapy, and during states of excess mineralocorticoid or glucocorticoid.

Reference Values

No established reference values

Random urine potassium may be interpreted in conjunction with serum potassium, using both values to calculate fractional excretion of potassium.

The calculation for fractional excretion (FE) of potassium (K) is

FE(K)= ([K(urine) X Creat(serum)]/[K(serum) X Creat(urine)]) X 100

Interpretation

Hypokalemia reflecting true total body deficits of potassium (K+) can be classified into renal and nonrenal losses based on the daily excretion of K+ in the urine. During hypokalemia, if urine excretion of K+ is less than 30 mEq/day, it can be concluded that renal reabsorption of K+ is appropriate. In this situation, the causes for the hypokalemic state are either

decreased K+ intake or extra renal loss of K+ rich fluid. Urine excretion of more than 30 mEq/day in a hypokalemia setting is inappropriate and indicates that the kidneys are the primary source of the lost K+.

Cautions

Ion-selective electrodes are selective for the ion in question but are not specific. Other monovalent cations may interfere but not in the physiologic range.

Clinical Reference

1. Delaney MP, Lamb EJ: Kidney disease. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:1308-1309

2. Toffaletti J: Electrolytes. In: Dufour DR, Rifai N, eds. Professional Practice in Clinical Chemistry: A Review. AACC Press; 1993

Performance

Method Description

The ion-selective electrode (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: Potassium. Roche Diagnostics; V14.0 02/2018)

PDF Report

No

Specimen Retention Time

7 days

Performing Laboratory Location

Rochester

Fees & Codes

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

84133

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
RKUR	Potassium, Random, U	2828-2

Result ID	Reporting Name	LOINC®
RKUR	Potassium, Random, U	2828-2