



Review of Statewide Data Leads to Revised Reference Range for Outpatient Serum Potassium Results

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OVER THE PAST SEVERAL MONTHS, PAML and its testing partners have been involved in an extensive project to review all aspects of outpatient potassium testing. The goals of the project were twofold:

- To standardize specimen drawing, processing, and transport procedures in order to minimize pre-analytical effects on potassium results.
- To ensure that the reference range for outpatient serum potassium results accurately reflects the clinical status of those patients.

In the first phase of the project, we worked with the vendor of the blood-drawing tubes, we carried out extensive education in patient service centers on blood drawing technique and centrifugation protocols, and we detailed couriers on optimum transport of specimens. We changed procedures throughout the system in order to minimize hemolysis that can lead to increased potassium results. Hemolysis is the critical factor, since rupture of only 0.5% of the erythrocytes in a specimen can cause an increase in potassium of 0.5 mmol/L.

In the second phase of the project, we reviewed our serum potassium reference range of 3.5 to 5.0 mmol/L. The range had been established through a statewide study at several testing centers, using NCCLS national guidelines for such studies, but client physicians were concerned that they were seeing too many outpatients with elevated potassium results. It was felt that perhaps the upper cut-off of 5.0 mmol/L was too low for outpatients, due to unavoidable preanalytical variables when blood is drawn at many different locations and sometimes transported long distances before analysis.

We undertook a computerized review of 23,000 outpatient potassium results from four testing centers across the state of Washington. The data plots showed a considerable amount of "tailing" of results above the cutoff of 5.0 mmol/L. Since the data were from outpatients and not from individuals who could be strictly defined as healthy, the usual statistical analysis could not be applied to establish the upper cut-off. Extensive review of the data by the Technical Operations Group suggests that an upper cutoff of 5.3 mmol/L is more realistic than the established cut-off. Effective February 26, 2002, the new reference range for outpatient serum potassium is 3.5-5.3 mmol/L. The inpatient plasma reference range for potassium will remain at 3.5-5.0 mmol/L.

FAST FACTS

Potassium Reference Ranges

- ▶ PAML and its testing partners have optimized and standardized specimen drawing, processing and transport procedures to minimize hemolysis.
- ▶ 23,000 outpatient serum potassium results were reviewed to establish a new upper reference range cutoff.
- ▶ The new reference range for outpatient serum potassium is 3.5 - 5.3 mmol/L.
- ▶ The reference range for inpatient plasma potassium will remain at 3.5 - 5.0 mmol/L.

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