

## ORIGINAL ARTICLE

# Comparison of Two Clinical Chemistry Analyzers by Total Analytical Error and Measurement Uncertainty

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### SUMMARY

**Background:** Although analytical errors contain a small portion of laboratory errors, they are important in terms of intervention ability and practicality of follow-up by laboratory professionals. Also, from this point of view, the test results' quality, reliability, and accuracy are crucial to laboratories. Therefore, to determine analytical performance parameters for quality management in the analytical phase, clinical laboratories utilize total analytical error (TAE), bias, coefficient of variation (CV), and uncertainty of measurement (MU).

**Methods:** Fifteen biochemistry parameters were compared with Beckman Coulter AU 5800 for 2017 - 2018 and Roche Cobas 8000 for 2019 - 2020 in terms of TAE and MU. The results were evaluated between devices and compared with the EuBIVAS, CLIA, RCPA, PRDEQA%, pUQEAS%, pU%, and TEa-TR datasets.

**Results:** There were no significant differences between the devices for the mentioned periods. Device performances resulted in similar outcomes. During our four-year study, nearly all of our tests failed for EuBIVAS, RCPA, and pU%. On the contrary, almost all of our parameters gave valid results according to the CLIA, PRDEQA%, pUQEAS%, and TEa-TR ranges.

**Conclusions:** It is crucial to distinguish between "mistake" and "uncertainty." The discrepancy between the measured value and the 'actual value' is called error. Uncertainty is a measure of how confident you are in the measurement outcome. We endeavor to remedy any known inaccuracies wherever feasible by applying adjustments from calibration certifications. On the other hand, any inaccuracy whose value is unknown is a cause of doubt.  
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## Supplementary Data

Table S1.

	<b>AU 5800</b>	<b>COBAS 8000</b>
<b>Albumin</b>	<b>BCG Dye Binding, Colorimetric</b>	<b>BCG Dye Binding, Colorimetric</b>
<b>ALP</b>	<b>IFCC</b>	<b>IFCC</b>
<b>ALT</b>	<b>IFCC UV without 5PP</b>	<b>IFCC UV without 5PP</b>
<b>AST</b>	<b>IFCC UV without 5PP</b>	<b>IFCC UV without 5PP</b>
<b>Cl</b>	<b>ISE, diluted (indirect)</b>	<b>ISE, diluted (indirect)</b>
<b>Cholesterol</b>	<b>Enzymatic</b>	<b>Enzymatic</b>
<b>Crea</b>	<b>Kinetic alkaline picrate (Jaffe reaction)</b>	<b>Kinetic alkaline picrate (Jaffe reaction)</b>
<b>Glucose</b>	<b>Hexokinase, UV</b>	<b>Hexokinase, UV</b>
<b>HDL</b>	<b>Enzymatic colorimetric test (immunoinhibition)</b>	<b>Enzymatic colorimetric test (immunoinhibition)</b>
<b>LDH</b>	<b>IFCC</b>	<b>IFCC</b>
<b>K</b>	<b>ISE, diluted (indirect)</b>	<b>ISE, diluted (indirect)</b>
<b>TP</b>	<b>Biuret method</b>	<b>Biuret method</b>
<b>Na</b>	<b>ISE, diluted (indirect)</b>	<b>ISE, diluted (indirect)</b>
<b>Triglyceride</b>	<b>GPO-PAP with 4-aminophenazone</b>	<b>GPO-PAP with 4-aminoantypirine</b>
<b>Urea</b>	<b>Urease, GLDH</b>	<b>Urease, GLDH</b>