Peer Group Report (data from July 2015)

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Data selection

Currently (July 2015) 128 laboratories participate with ~250 instruments. From those, we selected peer groups with n ≥5 instruments for data investigation and compared the data with the findings of our first peer group report (see Table below). Note, the number of participants using Integra instruments dropped, whereas the number of Vista users increased. Therefore, the Integra data is often omitted from the plots for the current period, and, where possible, the Vista data was added .

Typical number of instruments in a peer group (only groups with n ≥5)

Period	Abbott	Beckman		Ortho	Roche			Siemens	
	Architect	AU	Synchron	Vitros	Cobas	Integra	Modular	Advia	Vista
March 2014	11	7	10	20	66	6	9	5	/
July 2015	19	12	9	26	225	4-5	8	9	5

We made no further distinction according to instrument type. The main peer groups are still Roche Cobas, Ortho Vitros, and Abbott Architect.

Data presentation

Data are presented as box-and whisker plots with indication of the peer group median. The box represents laboratories within the 25th to 75th percentile; the whiskers extend to the minimum and maximum results.

Data from March 2014 is indicated in grey and set in the background; data from July 2015 is indicated in blue. To give an idea about the size of the dispersion, bias limits from the Percentiler (mentioned in the first global report; accessible on www.stt-consulting.com) are indicated with a grey shaded zone. These are constructed around the median value of the July 2015 data.

Overview

This report provides an update on the comparability status of the peer groups assessed with the Percentiler. If significant changes within a peer group occurred (compared with data of March 2014; first peer group report), it is mentioned in the individual observations. We therefore recommend to interpret the data of this second peer report together with the first one (accessible on www.stt-consulting.com). **In general the observed patterns of the plots changed little over the course of the year. Significant changes occurred for the small peer groups (n < 10), whilst other changes were restricted within the set bias specifications.**

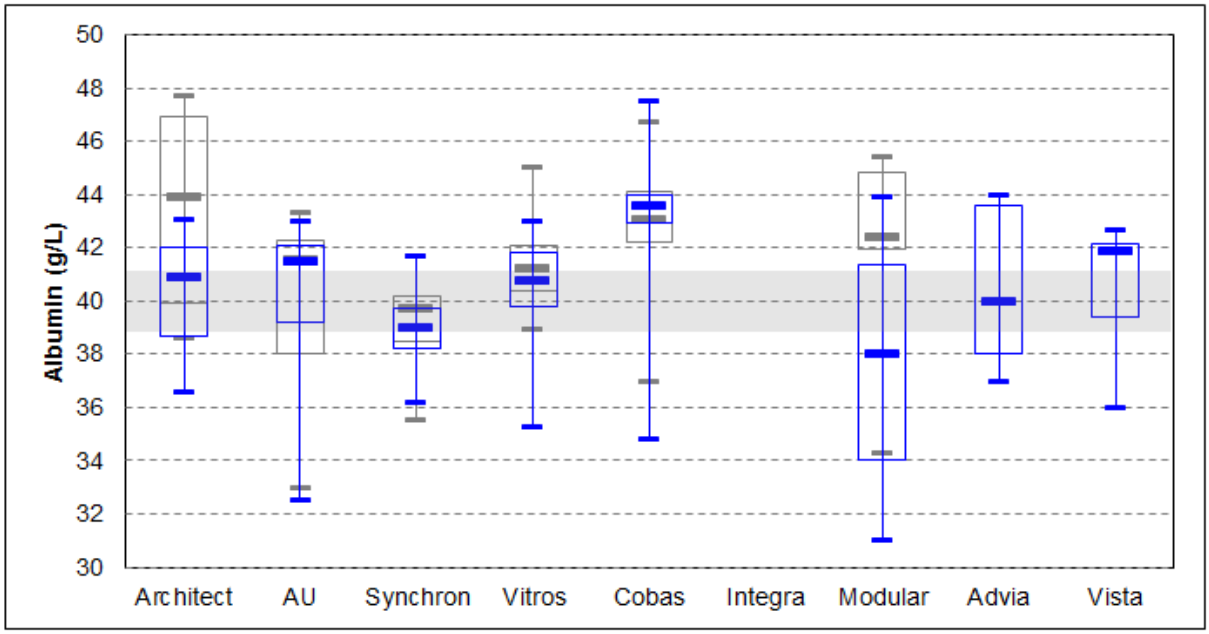
The Table gives an updated qualitative overview about peer group comparability and considerably deviating peer groups.

Analyte	Comparability	Note
Albumin	☹	
Alk. Phosphatase	😐/☹	Synchron ↓
ALT	😐	Vitros & Vista ↑
AST	☹	Challenging bias limit (1 U/L)
Calcium	☺/😐	Vista ↓
Chloride	☹	Challenging bias limit (1 mmol/L); Cobas ↓
Creatinine	😐	Method variants not distinguished
CRP	[😐]	Depends on outpatient stratification
GGT	😐/☹	May depend on outpatient stratification
Glucose	☹	Challenging bias limit (0.2 mmol/L)
Phosphate	😐/☹	Vitros ↑
LDH	☹	2 method principles; Vitros ↑
Magnesium	😐	
Potassium	😐/☹	Cave preanalytics ↑
Sodium	☺	
total-Bilirubin	☹	
total-Cholesterol	😐	
total-Protein	😐	
Urea	☺/😐	
Uric acid	☺/😐	

Note: This report addresses ONLY the peer group data and not the results of the individual laboratories! The results for peer groups with a low number of instruments should still be regarded as preliminary and interpreted with caution.

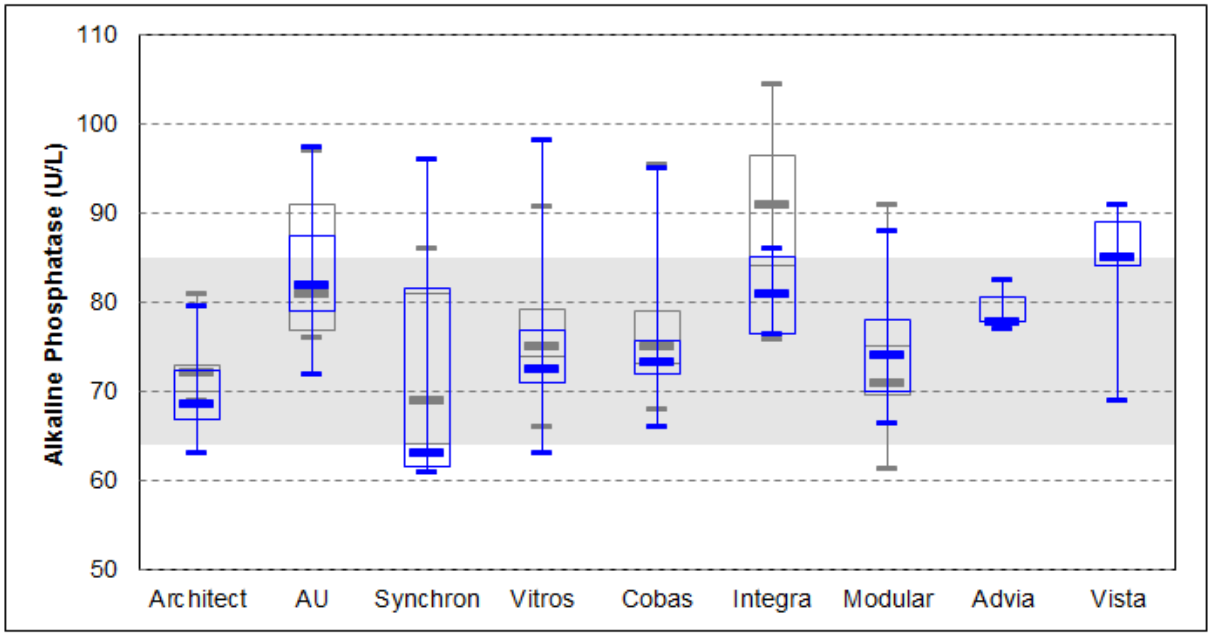
Individual results

Albumin



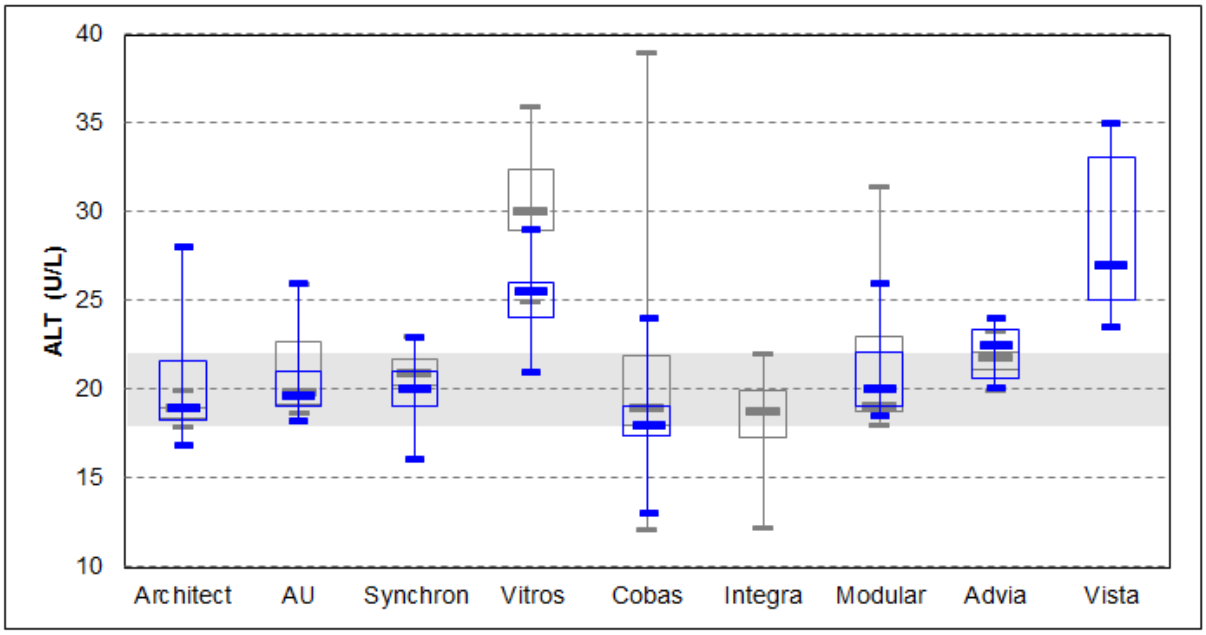
Compared to the data of March 2014, the median value of the Abbott Architect group dropped from 43.9 to 40.9 g/L and for Roche Modular from 42.4 to 38.0 g/L. For the other peer groups the level remained stable. Note, however, the broad “box” for the Modular group, which is caused by a low number of instruments (n = 9). The lower value for the Modular group might be caused by a population effect (e.g. hospital population with a low albumin level). Peer group medians in July 2015 range from 38.0 g/L (Modular) to 43.6 g/L (Cobas). The dispersion of the peer group medians remains somewhat high considering the low bias limit of 2.3% (1 g/L).

Alkaline phosphatase



The high value for the Integra group (90.9 U/L) in March 2014 dropped to 81.0 U/L. The overall median value remains 74 U/L, with a minimum of 62.5 U/L (Synchron) and a maximum of 85.0 U/L (Vista). The dispersion remains reasonable when compared to the bias limit of 7% (5 U/L); with the Synchron and Vista group borderline out of the specifications. These latter peer groups consist of a low number of instruments (n = 7 and 5 respectively), but the low value for Synchron and the somewhat high value for Vista were also observed in the Master Comparison 2014 results.

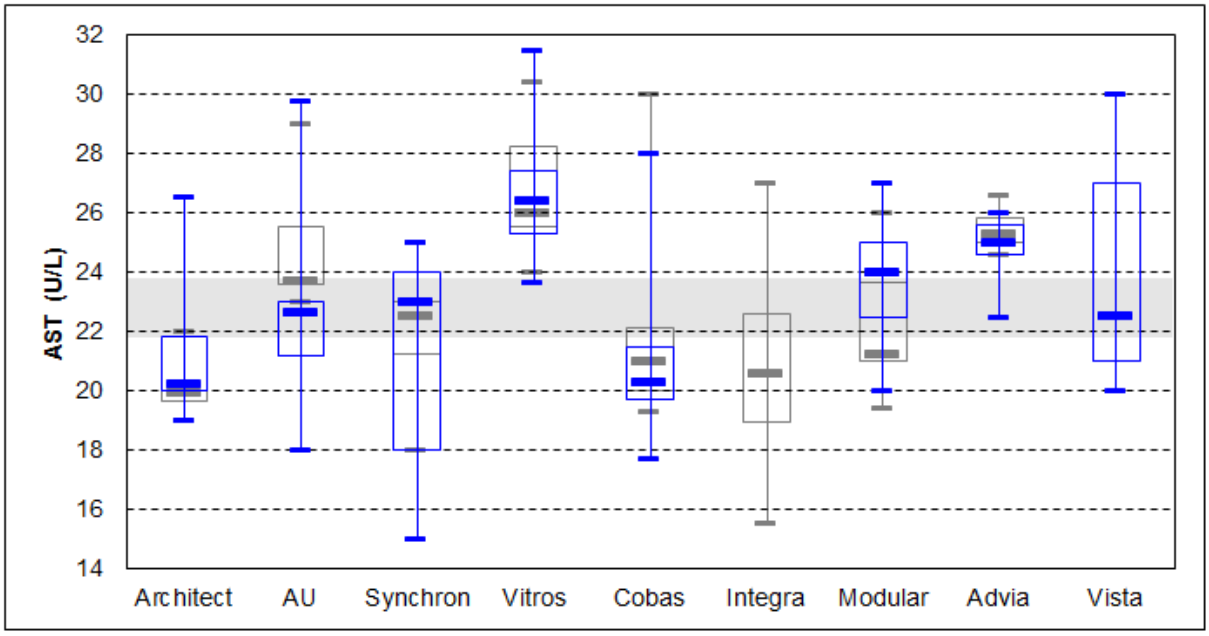
ALT



Note: we do not distinguish assays with/without pyridoxal-phosphate activation.

The Vitros values dropped from 30.1 to 25.5 U/L, getting closer to the overall median of the other peer groups of ~20 U/L. Next to the Vitros peer group, also the Vista shows a distinctly higher median of 27.0 U/L. The dispersion, with the exception for Vitros and Vista, remains moderate compared to the bias limit of 11% (2 U/L). The higher values for Vitros and Vista were also observed in the Master Comparisons 2014 study. Note, however, that both assays use pyridoxal-phosphate activation, while the others, typically don't.

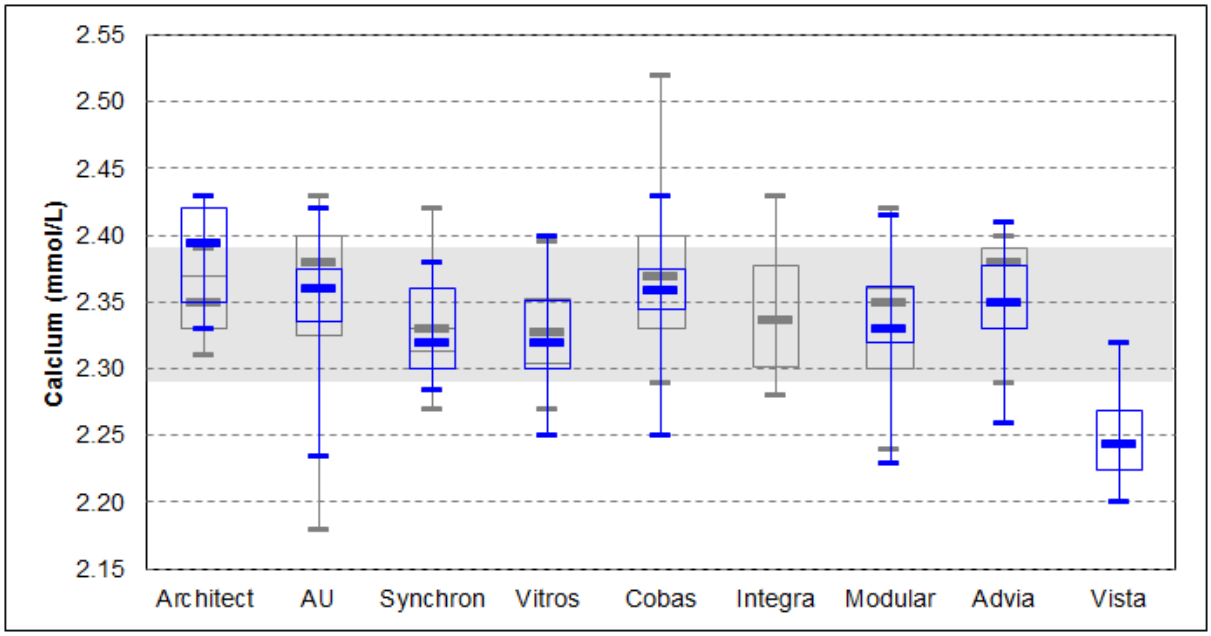
AST



Note: we do not distinguish assays with/without pyridoxal-phosphate activation.

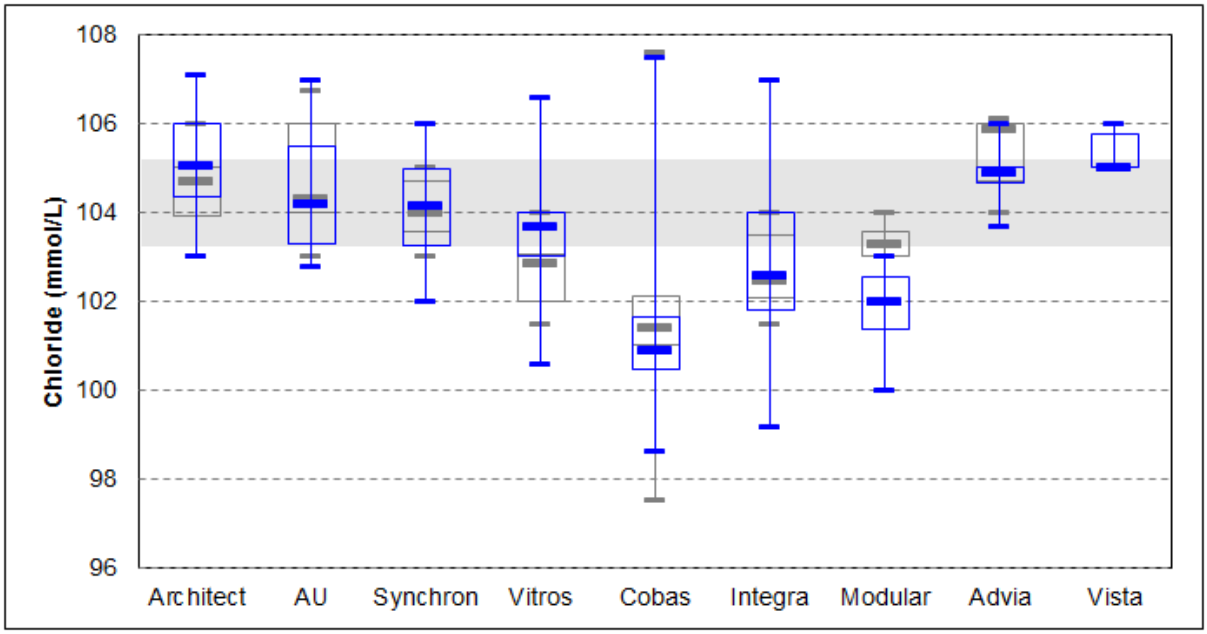
Changes occurred in the order of 1 – 2 U/L for small peer groups (AU and Modular). The overall median is 22.7 U/L, with a minimum of 20.2 U/L (Architect) and a maximum of 26.4 U/L (Vitros; note: pyridoxal-phosphate activation). Despite the small changes, the conclusion based on the plot stays the same: the dispersion remains high considering the bias limit of 4.9% (1 U/L).

Calcium



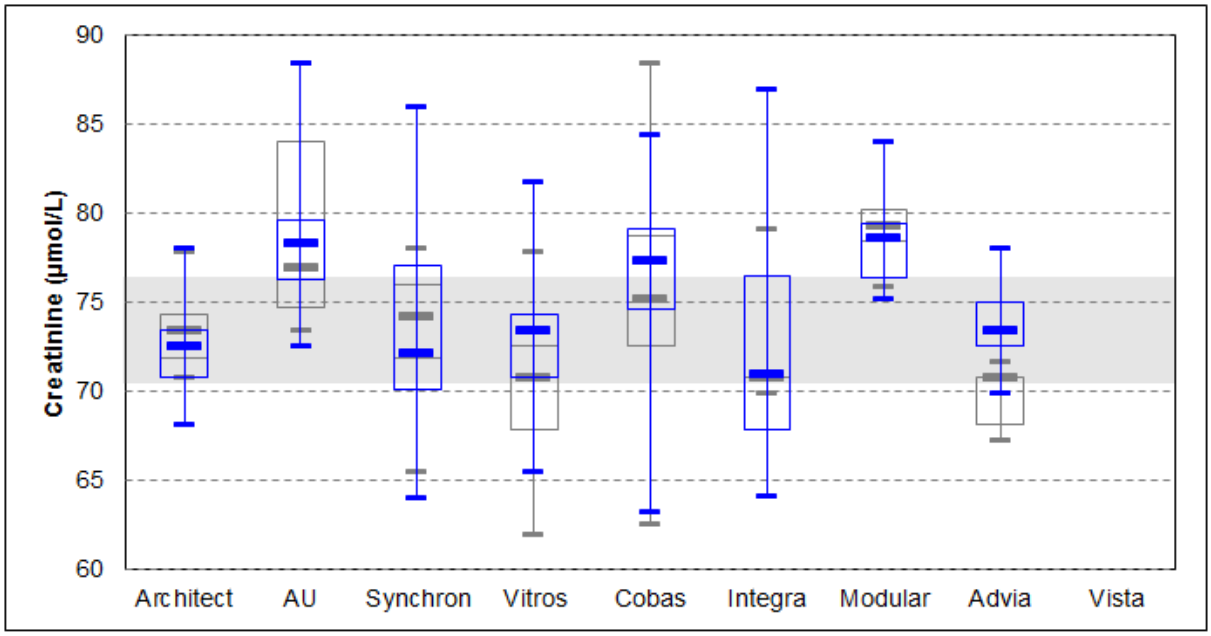
The overall median in July 2015, with the exclusion of the significantly lower Vista group (2.24 mmol/L), is 2.35 mmol/L, which is close to the potential target value of 2.34 mmol/L. Data shows a minimum of 2.32 mmol/L (Synchron and Vitros) and a maximum of 2.4 mmol/L (Architect). The dispersion remains low (except for Vista) compared to the small bias limit of 2.1% (0.05 mmol/L). The low value for Vista (n = 6), however, has to be confirmed in the future.

Chloride



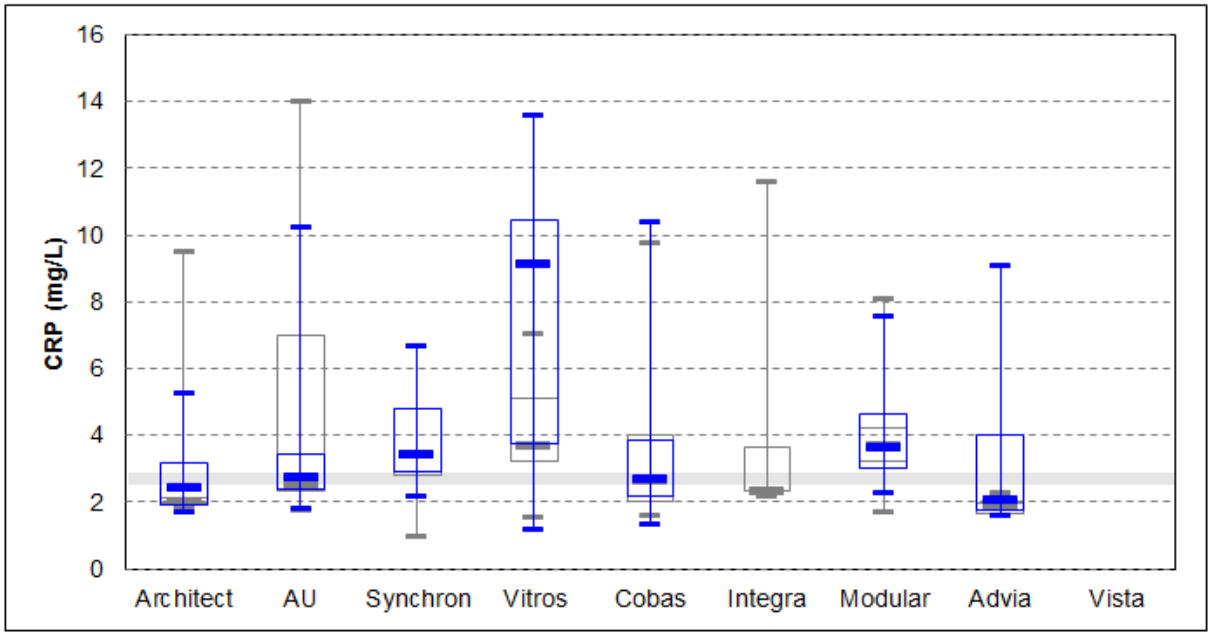
The observed March 2014 patterns remained, with significantly lower values for the Roche instruments. Currently, the overall median is 104.2 mmol/L, with a minimum of 100.9 mmol/L (Cobas) and a maximum of 105.1 mmol/L (Architect). The dispersion remains high in view of the small bias limit of 1% (1 mmol/L).

Creatinine



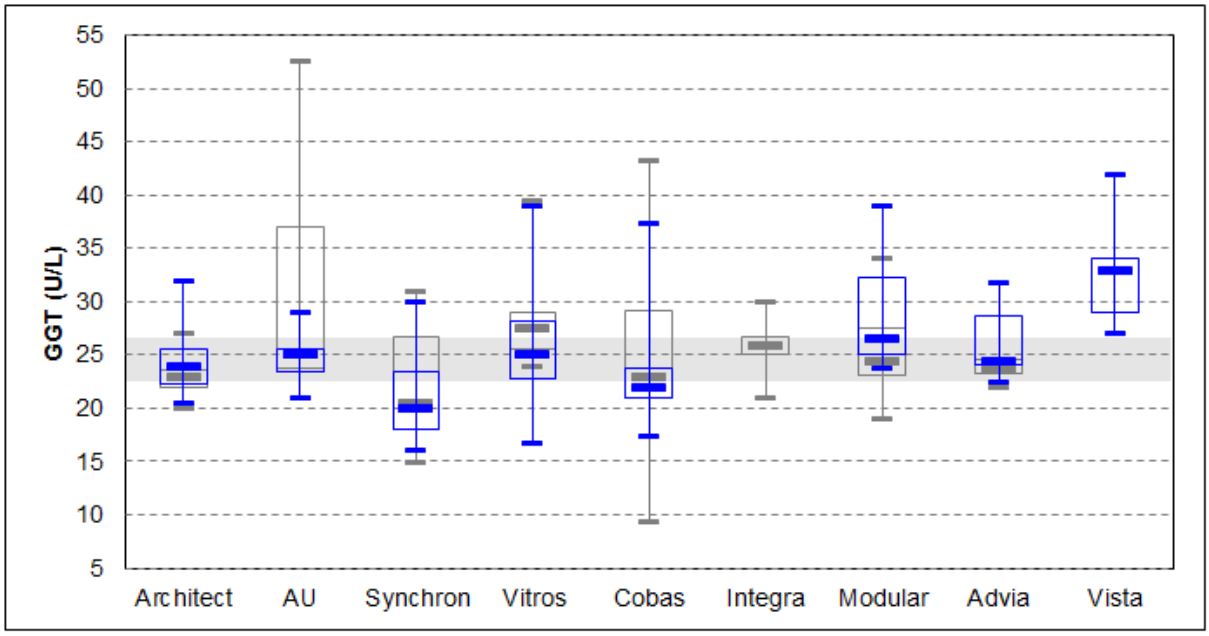
The distribution of the participants remained quite stable over the year; the biggest change is observed for Advia (from 70.7 to 73.4 µmol/L). The overall median in July 2015 is 73.4 µmol/L, with a minimum of 70.9 µmol/L (Integra) and a maximum of 78.7 µmol/L (Modular). The dispersion remains moderate seen the bias limit of 4.1% (3 µmol/L) and the different procedure variants on the market (note: we do not distinguish between Jaffe & enzymatic procedures).

CRP



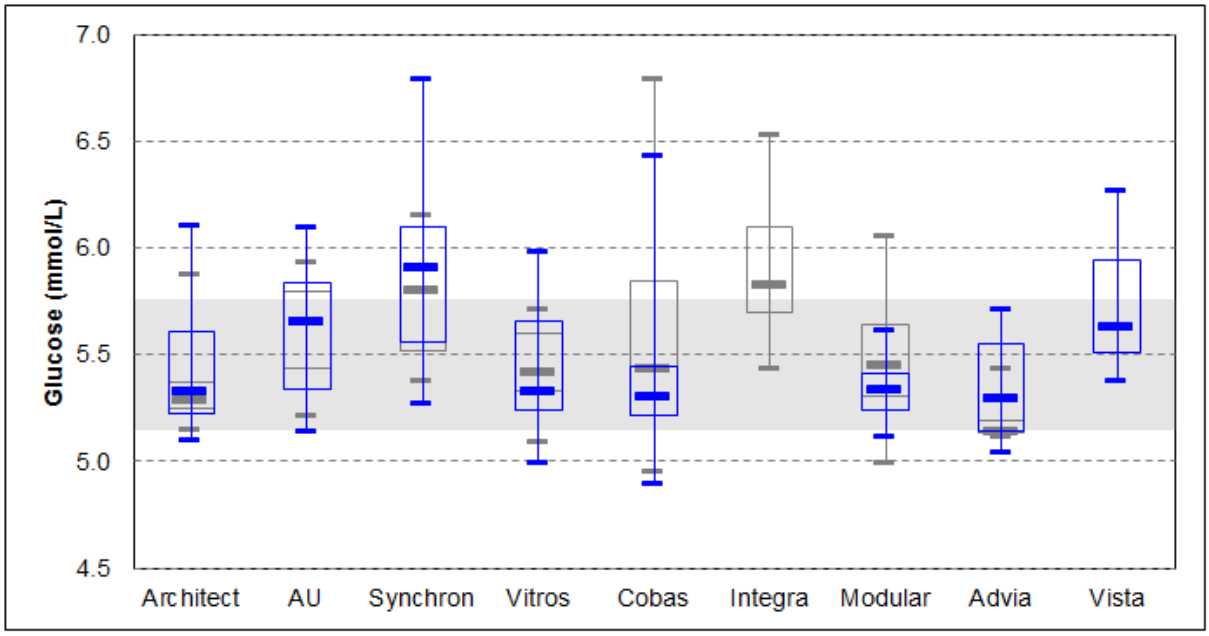
In March 2014, all CRP median values were between 2 – 4 mg/L. Currently, the Vitros group has an increased dispersion (“large box”) with a higher median value (9.1 mg/L), most likely caused by population effects and a significant “recalibration” of the assay used in several laboratories. In July 2015 the overall median is 3.5 mg/L, with a minimum of 2.1 mg/L (Advia) and a maximum of 9.1 mg/L. These data remain difficult to interpret as CRP is highly dependent on the success of outpatient stratification in the laboratories.

GGT



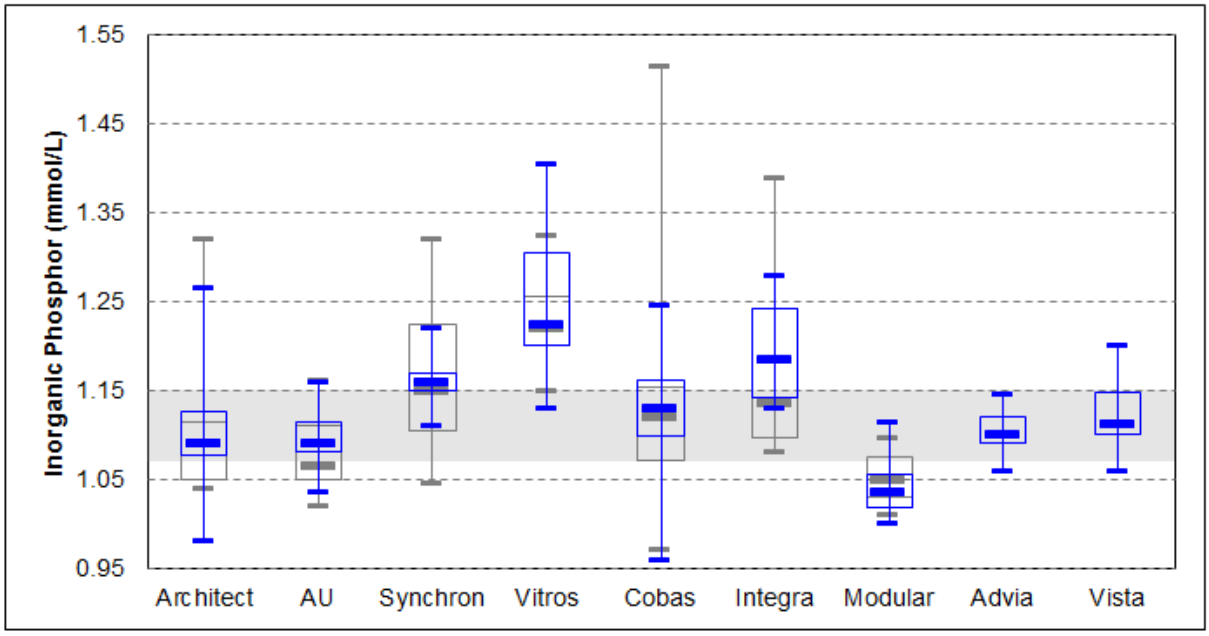
Compared to the data from March 2014, the pattern is similar for all peer groups and the dispersion within each group has somewhat decreased. Currently, the overall median is 24.0 U/L, with a minimum of 20.0 U/L (Synchron) and a maximum of 27.5 U/L (Vitros). The dispersion remains moderate-high when compared to the bias limit of 9.5% (2 U/L). Results may still be influenced by the success of outpatient stratification.

Glucose



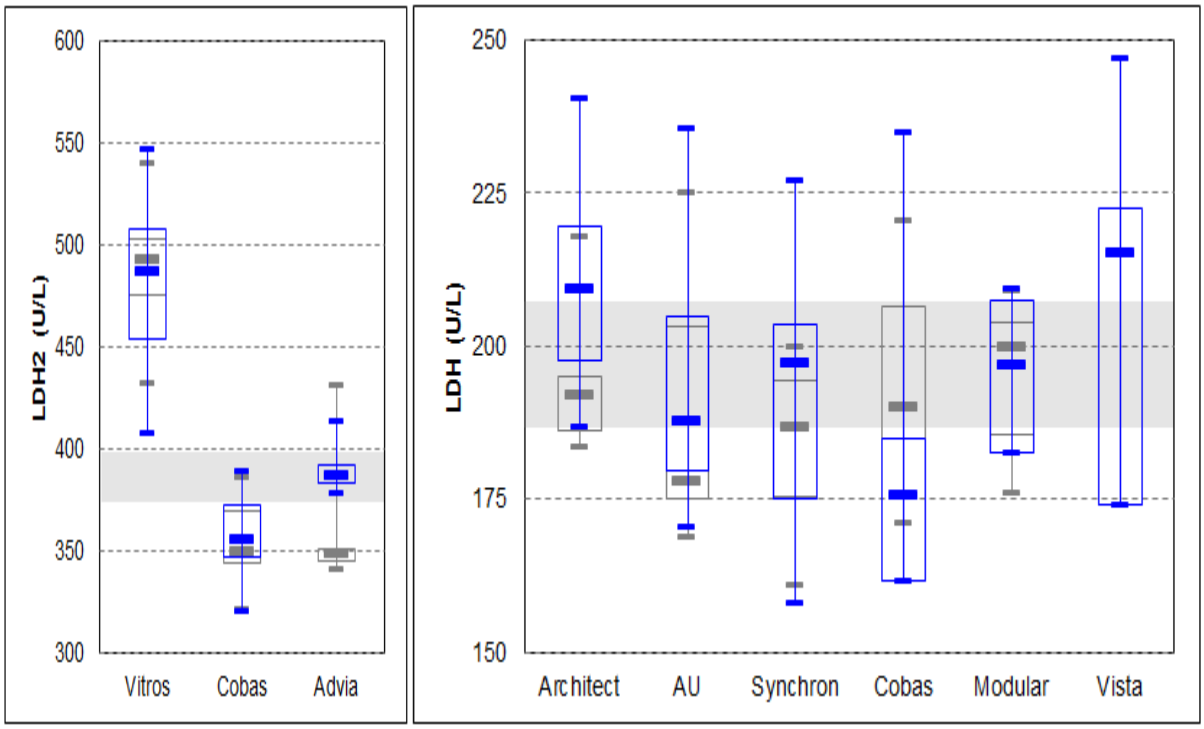
The somewhat lower values for Advia observed in March 2014, have increased to a level close to the overall median of 5.34 mmol/L. The lowest median value is still observed for Advia (5.30 mmol/L) and the highest values are found for Synchron (5.91 mmol/L). Compared to the bias limit of 3.8% (0.2 mmol/L) the dispersion is acceptable, with the exception of higher values for Synchron (note: the higher values may result from population effects).

Inorganic Phosphate



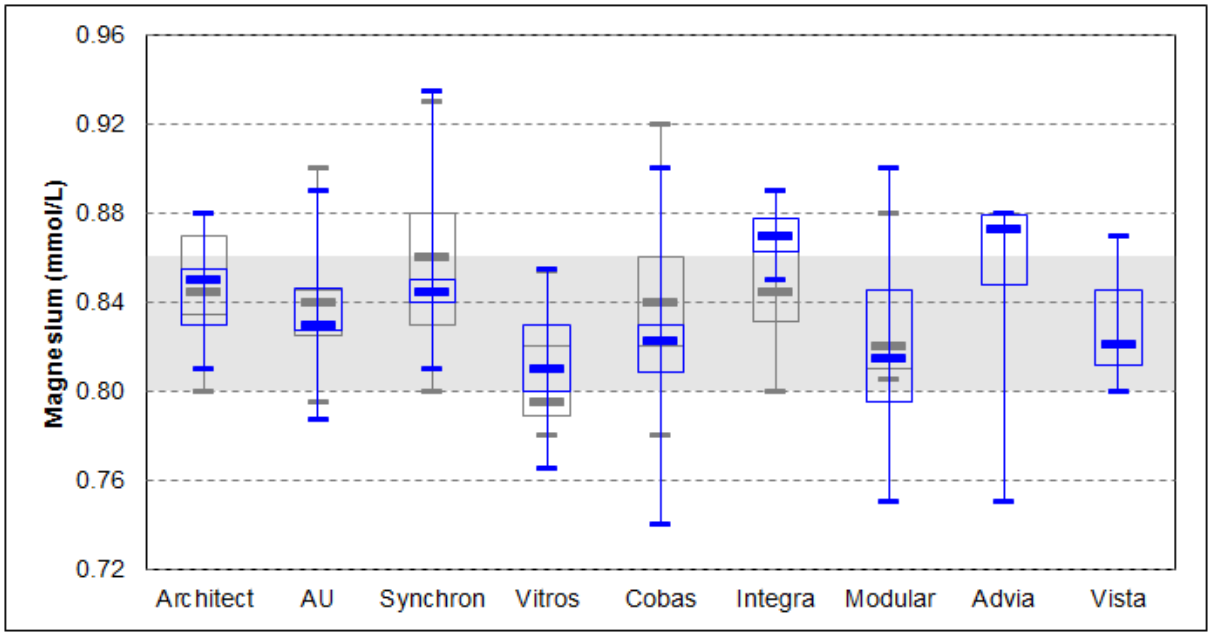
The pattern of the plots remained stable for all peer groups and the overall median still equals 1.11 mmol/L (close to the potential target of 1.13 mmol/L), with a minimum of 1.04 mmol/L (Modular) and a maximum of 1.23 mmol/L (Vitros). The Vitros values remain to be high compared to the other peer groups, but even without Vitros, the dispersion remains moderate compared to the bias limit of 3.6% (0.04 mmol/L).

LDH



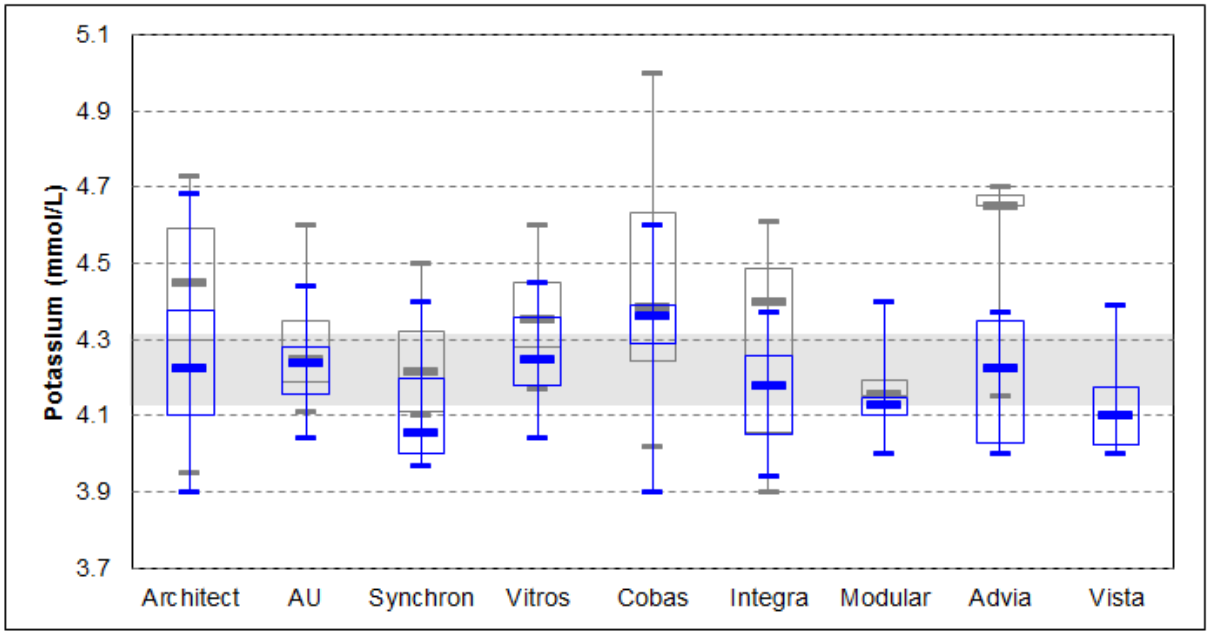
We distinguish 2 method principles (LDH = lactate>pyruvate; LDH2 = pyruvate>lactate). LDH2 gives ~2 x higher results than LDH. For LDH the pattern remained quite similar for all peer groups, with the exception of Cobas which dropped from 190.0 to 168.7 u/L (note: this is due to the large number of instruments from a new laboratory). Currently the overall median for LDH is 192.5 U/L, with a minimum of 168.7 U/L (Cobas) and a maximum of 215.5 U/L (Vista). The dispersion is acceptable to moderate compared to the bias limit of 5.4% (10 U/L). For LDH2, Vitros still gives considerably higher results than the other 2 assays.

Magnesium



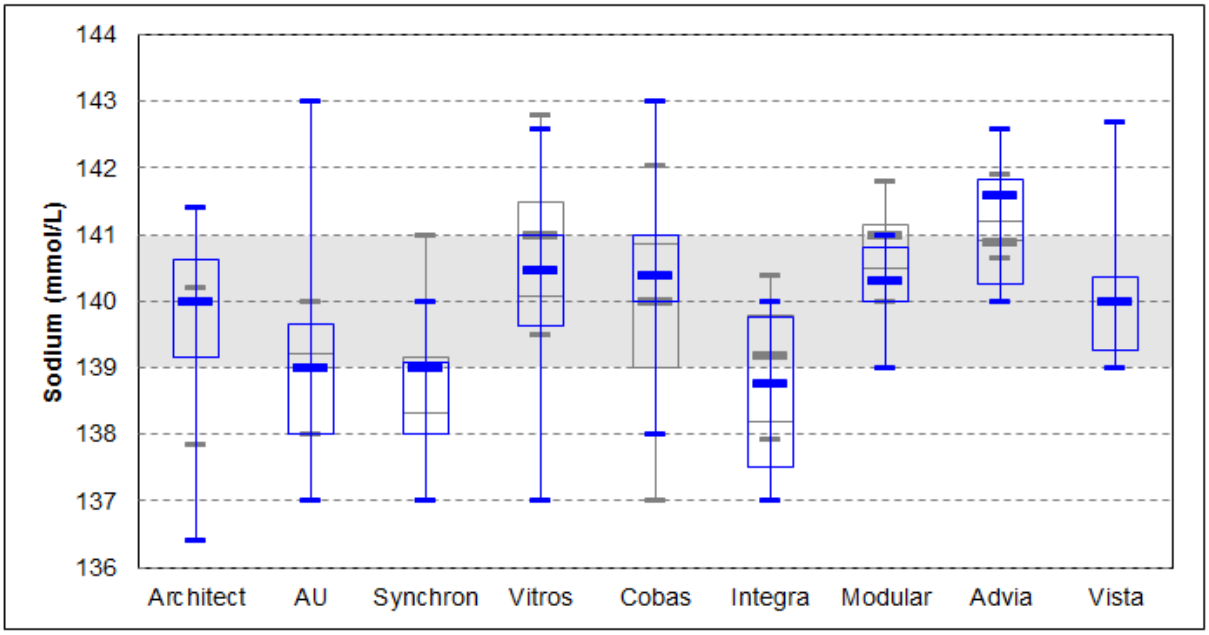
The pattern of the plots remained stable for most peer groups. The Cobas peer median dropped insignificantly from 0.84 to 0.82 mmol/L. For July 2015, the overall median is 0.83 mmol/L, with a minimum of 0.81 mmol/L (Vitros) and a maximum of 0.87 mmol/L (Integra & Advia). The dispersion remains acceptable compared to the bias limit of 3.5% (0.03 mmol/L); with Integra and Advia borderline outside the specifications.

Potassium



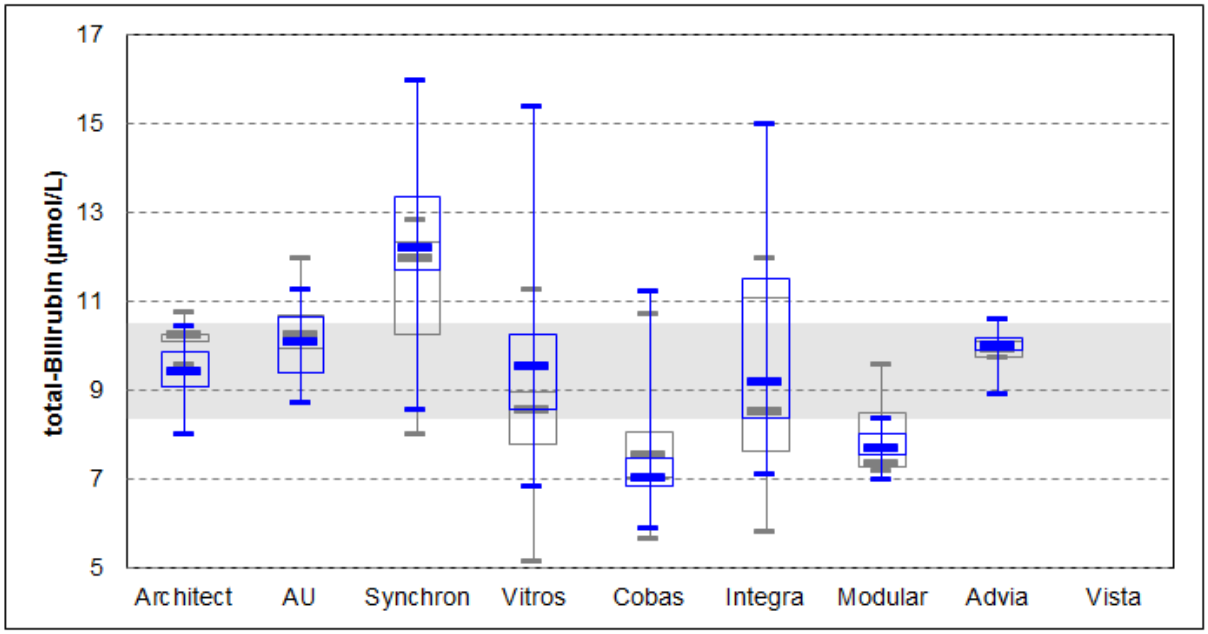
Median values dropped somewhat for most peer groups leading to a lower overall median of 4.23 mmol/L (4.37 mmol/L in March 2014), with a minimum of 4.06 mmol/L (Synchron) and a maximum of 4.36 (Cobas). The dispersion remains high compared to the bias limit of 3.4% (0.015 mmol/L). High potassium values are still related with pre-analytical problems for private laboratories; low potassium values may be due to good pre-analytics (undelayed serum separation).

Sodium



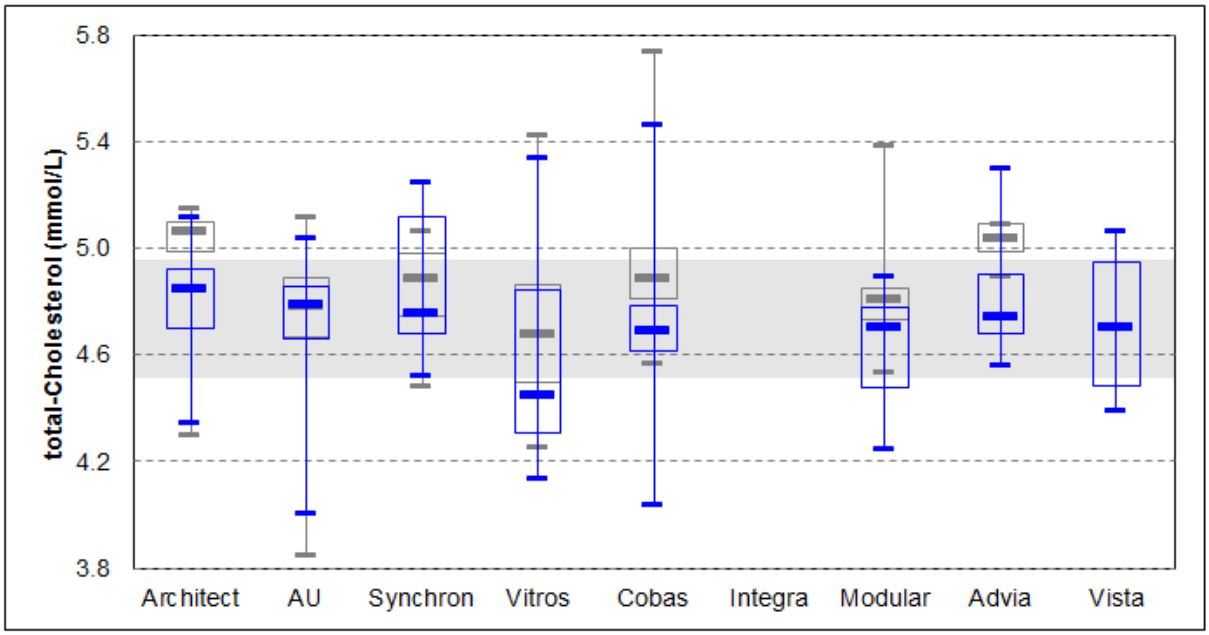
The good comparability status remains! The overall median is 140.0 mmol/L (close to the potential target of 141 mmol/L), with a minimum of 138.8 mmol/L (Integra) and a maximum of 141.6 (Advia). The dispersion is low in view of the tight bias limit of 0.7% (1 mmol/L). Only the Advia and Integra peer groups are outside the specifications, but the Advia value has to be confirmed in the future (n = 8).

total-Bilirubin



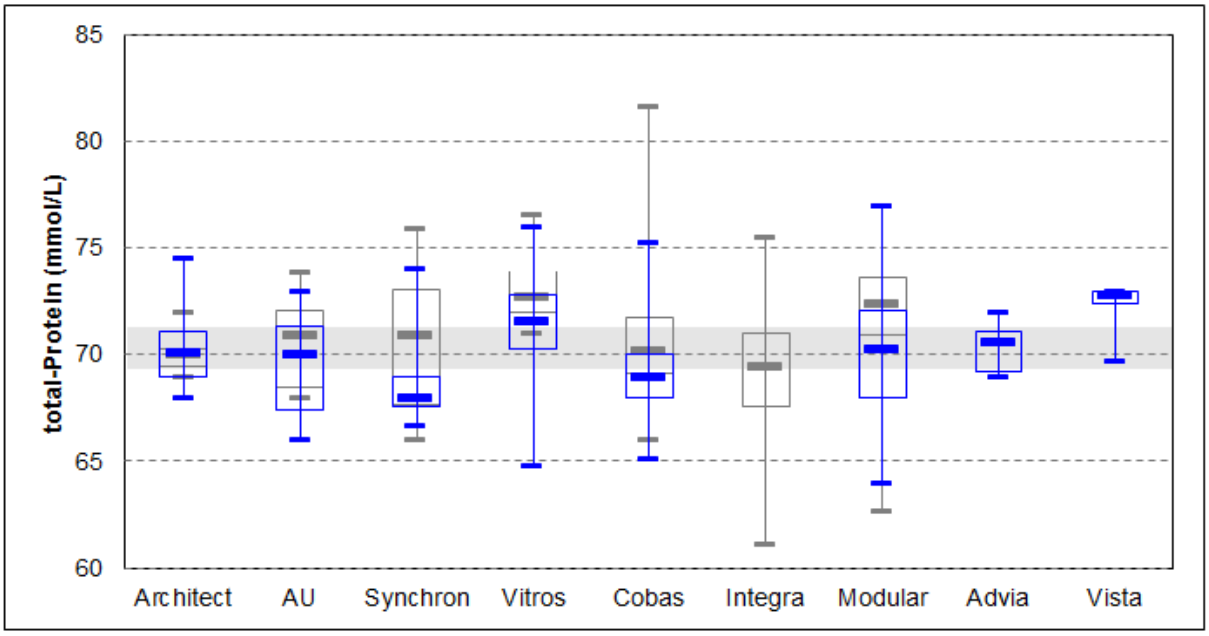
The pattern of the plots remained quite stable for all peer groups. Currently, the overall median is 9.3 µmol/L, with a minimum of 7.0 µmol/L (Cobas) and a maximum of 12.2 µmol/L (Synchron). The dispersion remains high when compared to the bias limit of 12.2% (1 µmol/L).

total-Cholesterol



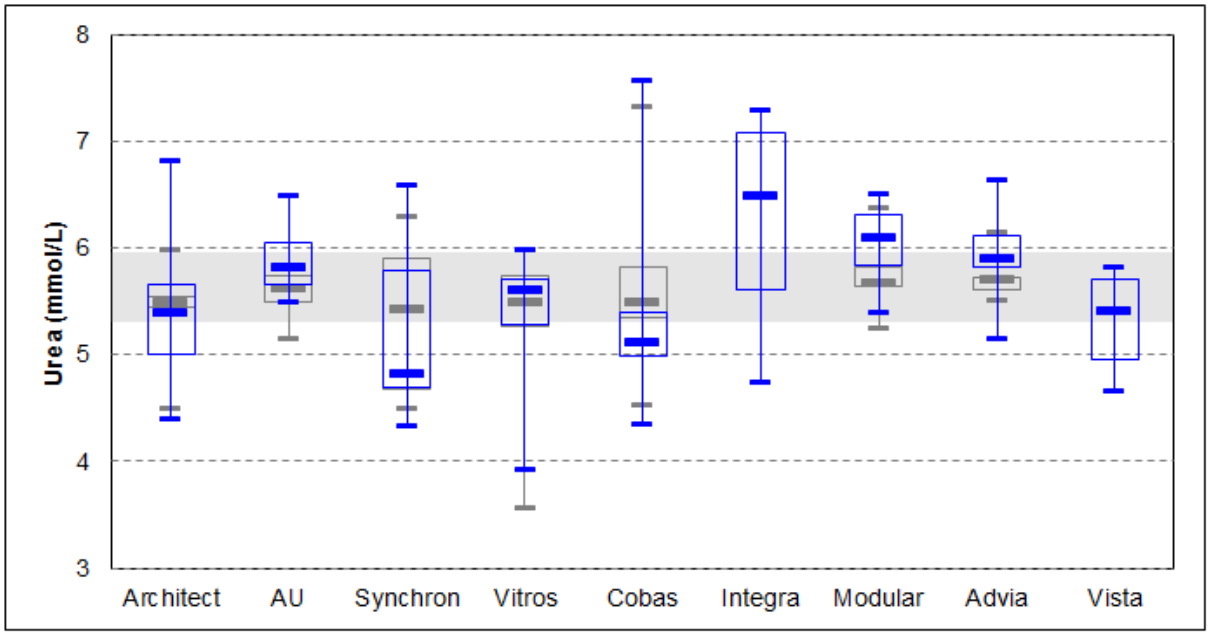
Apart from some small changes, the overall pattern of the plot is stable for all peer groups. The overall median is now 4.75 mmol/L, with a minimum of 4.45 mmol/L (Vitros) and a maximum of 4.85 mmol/L (Architect). The dispersion is good considering the bias limit of 4.1% (0.2 mmol/L).

total-Protein



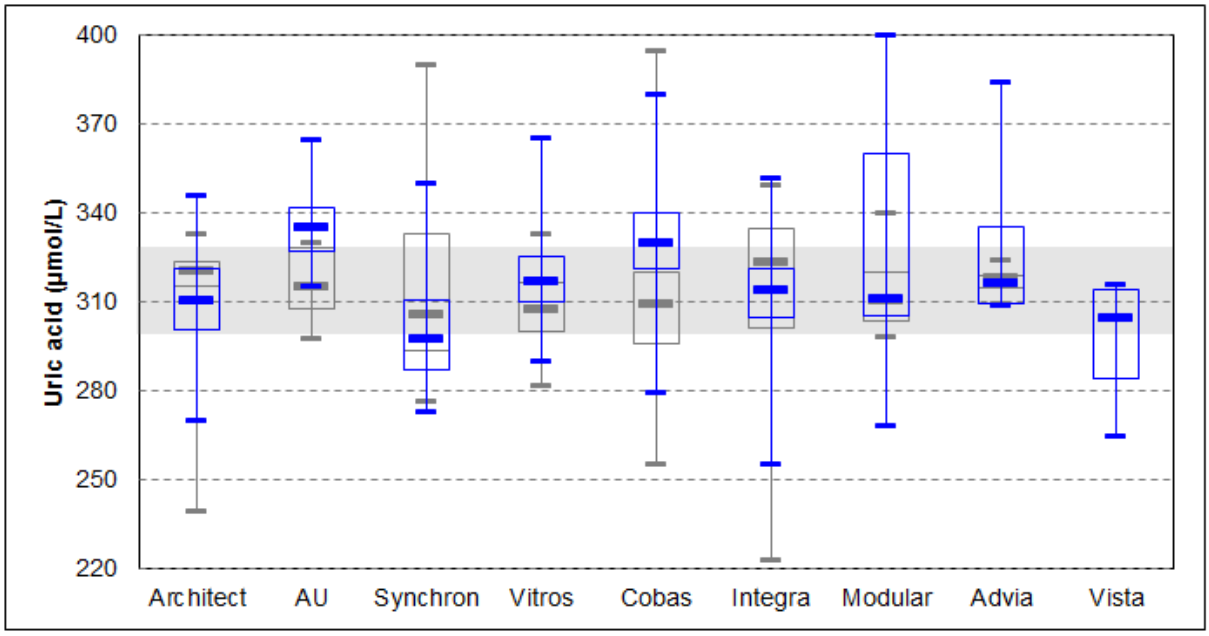
Only small changes are observed for most of the peer groups. In July 2015, the overall median is 70.2 g/L (close to the potential target of 69.8 g/L), with a minimum of 68.0 g/L (Synchron) and a maximum of 72.9 g/L (Vista). The dispersion remains acceptable in view of the tight bias limit of 1.4% (1 g/L).

Urea



The dispersion of the peer groups increased significantly, however, given the bias limit of 5.5% (0.3 mmol/L), the dispersion remains acceptable for most peer groups. Currently, the overall median is 5.62 mmol/L, with a minimum of 4.83 mmol/L (Synchron) and a maximum of 6.5 mmol/L (Modular & Advia).

Uric acid



Again, changes occurred for several peer groups, but mostly within the range of the bias specification. The overall median is 314 µmol/L, with a minimum of 298 µmol/L (Synchron) and a maximum of 335 µmol/L (AU). The dispersion remains acceptable in view of the bias limit of 4.7% (15 µmol/L).