COLLEGE of AMERICAN PATHOLOGISTS

Educational Discussion: Urine Chemistry Grading

2016-A Urine Chemistry General Survey (U)

Back to the Future

With all due respect to our predecessors in 1997, the current Chemistry Resource Committee, after a great deal of discussion over several months, has decided to revise the evaluation criteria for the U Survey.For most of the analytes in this Survey, we are implementing targets of peer group mean plus or minus three standard deviations (±3SD).

For those of you who have looked at the current grading criteria, you may have wondered where the limits came from:

Analyte	Target Value	Evaluation Criteria
Amylase	Peer Group	± 3 SD
Calcium	Peer Group All Method Principles/ All Instruments	± 31%
Chloride	Peer Group All Method Principles/ All Instruments	± 26% or 3 SD whichever is greater
Creatinine	Peer Group All Method Principles/ All Instruments	± 17%
Glucose	Peer Group All Method Principles/ All Instruments	± 6 mg/dL or 20% whichever is greater
Magnesium	Peer Group All Method Principles/ All Instruments	± 25%
Osmolality	Peer Group	± 3 SD
Phosphorus	Peer Group All Method Principles/ All Instruments	± 23%
Potassium	Peer Group All Method Principles/ All Instruments	± 29%

Sodium	Peer Group All Method Principles/ All Instruments	± 26%
Total Protein	Peer Group All Method Principles/ All Instruments	± 44%
Urea Nitrogen	Peer Group All Method Principles/ All Instruments	± 21%
Uric Acid	Peer Group All Method Principles/ All Instruments	± 24%
Urine albumin	Peer Group All Method Principles/ All Instruments	± 30%

In reality, though, we understand that most participants probably look over their Survey results and, in the absence of seeing problems, do not consider the limits or their underlying rationale. To the extent that this is true, few participants would have reason to look beyond their own U survey results: virtually everyone passes, as the limits have been quite "generous". If we take urine phosphorus as an example, the observed limits (plus or minus 23% of the all-lab mean) represent **roughly ±6SD** (!) for many of the peer groups. (To calculate this value, divide 23% by the individual peer group observed CV; any observed CV of 3.8% or less means that 23% represents 6SD or more).

Rest assured that the new criteria will not cause a large flood of failures. Plus or minus 3 SD means that 99% of every peer group will pass. What it will do, though, is hold each of us to a more reasonable standard. This is a more conventional grading criterion, but it does have some of its own limitations. For example, some peer groups, with very tight inter-laboratory variability, will have much narrower limits than others. However, they will still enjoy a 99% passing rate. In order to see how good agreement among participants in any peer group is, one can look at the SD or CV listed in the Participant Summary Report.

To give credit to the old criteria, they represented an effort to take into account "medical analytic goals" by incorporating method accuracy, method precision, intra-individual biologic variability, and clinical significance of results at different concentrations.

We recognize the importance of the concept of “medical analytic goals”, but we think that PT should set a higher standard, not a lower standard, as it represents only analytic variability, albeit on a somewhat artificial matrix. Knowing the analytic variability within a peer group and across peer groups can offer some insights into performance. If others wish to determine what the effects of analytic variability on medical decision-making are, they can certainly gain insights on that from CAP PT data. But using intra-individual biologic variability and estimating requirements for medical decision-making have the effect of “loosening” performance criteria, which seems to us a disservice.

As a result, beginning with this U Survey, we have implemented the “new” grading criteria of peer group mean ± 3SD rule.

Gary L. Horowitz, MD, FCAP, Chair
Chemistry Resource Committee