COLLEGE of AMERICAN PATHOLOGISTS

Educational Discussion: Update on 25-OH Vitamin D Grading

2022-A Accuracy-Based Vitamin D Survey (ABVD)

The 2022 ABVD-A challenges are composed of pooled off-the-clot, freshly frozen serum samples obtained from several donors, some of whom received oral vitamin D_2 prior to their blood draw. The target values for 25-hydroxyvitamin D (25-OH vitamin D) were established by the LC-MS/MS reference measurement procedure performed at the Centers for Disease Control and Prevention Reference Laboratory. The minimal processing of the samples prior to distribution was vital in producing samples that are commutable across different assay platforms (including immunoassays, HPLC assays, and LC-MS/MS assays).

Results are provided in this Summary Report for total 25-OH vitamin D, 25-OH vitamin D_2, 25-OH vitamin D_3, and total calcium. The reference target values provided by the CDC Reference Laboratory are also shown for each sample.

The grading criteria for this Survey have been updated. Previously, acceptable performance required a value within 25% of the CDC reference value (or within 5 ng/mL, whichever is greater) for total 25-OH vitamin D. Starting with this Survey, formal grading is now provided for 25-OH Vitamin D_2 and for 25-OH Vitamin D_3. For these two analytes, acceptable performance requires a value within 25% of the CDC reference value (or within 2.5 ng/mL, whichever is greater). As might be anticipated from previous challenges, most laboratories using LC-MS/MS are performing acceptably with overall passing rates of 89-96% for 25-OH Vitamin D_3 and 96-100% for 25-OH Vitamin D_2. Since these are all laboratory developed tests, these challenges provide an excellent opportunity for non-passing laboratories to better understand whether chromatographic interferences need to be better resolved (e.g., C3-epi-25-OH vitamin D) or if the calibration method needs to be modified. While there were not enough laboratories using laboratory developed HPLC assays to statistically assess performance across laboratories, this Survey provides reference values for each analyte to help laboratories troubleshoot their assays.

There are a few things to notice from the box and whisker plots at the end of the Participant Summary Report: (1) as observed previously, there were a few immunoassay platforms that achieved 100% passing rates for all laboratories for all three challenges, including the Abbott Architect, Diasorin Liaison, and Roche Cobas e600/E170 platforms and (2) there continues to be issues with the reliability of the Beckman and Vitros platforms (62-92% and 55-80% passing rates, respectively).

There was no reference method performed for total calcium, but it appears that for methods with at least 10 participating laboratories, the methods are performing well, with 2.6 %CV across laboratories.

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