



## Educational Discussion: Estradiol Reporting

### 2020-B Accuracy-Based Testosterone, Estradiol (ABS)

Samples used for this accuracy-based Survey follow procedures to minimize matrix effects and produce commutable serum pools that are as close as possible to patient samples. Thus, measurement results can be compared not only within peer-group but also across peer-groups. In addition, reference values for testosterone and estradiol are provided which allows for comparison of laboratory results to the reference method and assessment of how much the measured value deviates from the true value. Measurement results reported by participants using the same assay may be considered replicate measurements. Thus, the mean bias and imprecision across peer groups can be calculated. The measurement variability and accuracy observed in the CAP accuracy-based Surveys provides unique and important information about the variability and accuracy of testing performed for patient care.

Estradiol is critical for a range of biological functions and blood estradiol levels outside the range typically observed in healthy women can lead to or promote disease. The North American Menopause Society is working with stakeholders to develop reference intervals for estradiol in postmenopausal women to better assess the impact of hormone therapy on estrogen levels. An overview of the work planned to be conducted is summarized in the recent report<sup>1</sup>. It is anticipated that the reference interval will be near, or even lower than, the concentration represented by sample ABS-06 (reference value: 17.9 pg/mL). Furthermore, the European Menopause and Andropause Society recommends a cut-off of 14 pg/mL to confirm diagnosis of premature ovarian failure<sup>2</sup>. Aromatase inhibitor therapy in women with breast cancer is considered effective when values are below 9.9 pg/mL<sup>3</sup>. Accurate measurement of low estradiol concentrations may also help monitor women treated with estrogen-containing postmenopausal therapies. Due to boxed warnings associated with these treatments, monitoring estradiol and maintaining the recommended target concentrations is essential<sup>4,5</sup>.

In this Survey, the results reported for sample ABS-06 ranged from 8 pg/mL to 35 pg/mL (Figure 1). It is interesting to note that while the majority of measurement results are higher than the reference value of 17.9 pg/mL, suggesting inaccuracy due to interferences, some laboratories report values below 14 pg/mL or no result. Also, there is high variability in measurement results within assay manufacturer groups. This high variability suggests problems related to sample processing by individual laboratories as well as assay inaccuracy. As anticipated, mass spectrometry-based assays show the highest agreement with the reference method. The findings suggest that measurements of estradiol in patients expected to have or being monitored for low estradiol levels might best be performed using mass spectrometry methods.

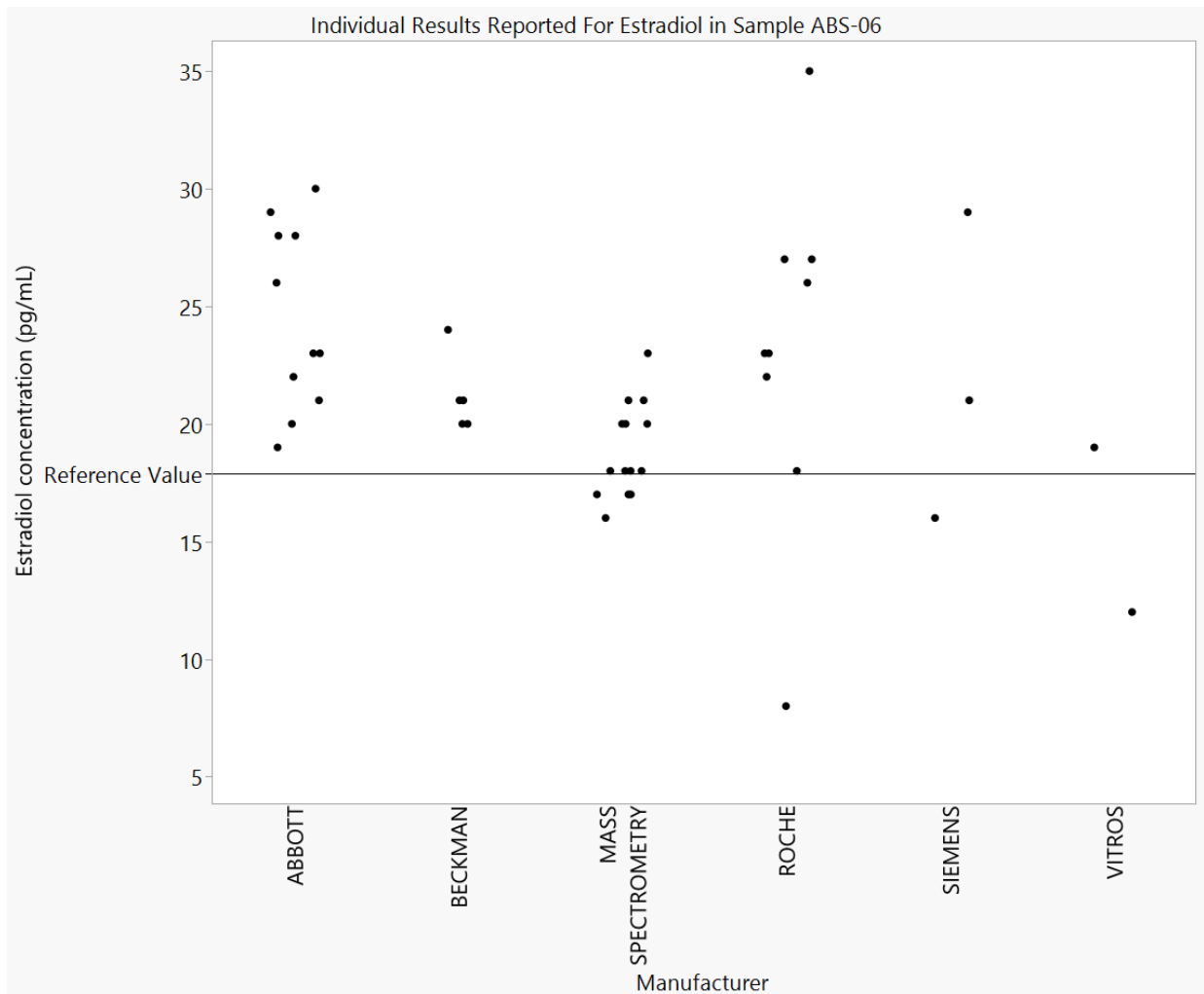


Figure 1: Estradiol concentrations reported for ABS-06. Line indicates reference value at 17.9 pg/mL.

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#### References

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3. Nagao T, Kira M, Takahashi M, et al. Serum estradiol should be monitored not only during the peri-menopausal period but also the post-menopausal period at the time of aromatase inhibitor administration. *World J Surg Oncol*. 2009;7:88.
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5. Pinkerton JV, Liu JH, Santoro NF, et al. Workshop on normal reference ranges for estradiol in postmenopausal women: commentary from The North American Menopause Society on low-dose vaginal estrogen therapy labeling. *Menopause*. 2020;27(6):611-613.