

## Short Article

# Extend Calibration Cycle of Homocysteine Measurement System in Clinical Laboratory

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## Abstract

Calibration is the basis of traceability of clinical biochemistry results. Different calibration cycle will bring different difficulties and economic costs to clinical laboratory. By extending the Homocysteine calibration cycle, the 72 hours given by the manufacturer were extended to 7 days. The new calibration cycle can significantly reduce the cost of the laboratory and improve the work efficiency.

**Keywords:** Homocysteine, Calibration cycle, Measurement system

Calibration is the basis of traceability of clinical biochemistry results. In some cases, the measurement system need to be recalibrated, such as changing the reagent lot number, replace the important parts of the instrument, the instrument has been maintained greatly, and internal quality control is abnormal. Even if the above situation does not occur, it should be noted that is necessary to recalibrate the item before the end of the reagent calibration cycle, so as to ensure the accuracy of patient detection results. Each commercial kit will establish its calibration cycle before leaving the factory. The calibration cycle of kits for different biochemical items may be different. The shorter calibration cycle may be several hours, and the longer one may be several months. Therefore, different calibration cycle will bring different difficulties and economic costs to clinical laboratory.

Homocysteine (Hcy) is a non-protein, neurotoxic, sulfur containing amino acid that originates from methionine metabolism [1]. Hcy is associated with increased risk of numerous pathological conditions, including cardiovascular Disease (CVD), stroke, Alzheimer's disease (AD), eye diseases, pregnancy complications, and neural tube defects (NTDs) [2]. Therefore, it is very significant to detect Hcy in laboratory. The calibration cycle of Hcy kits from different manufacturers is different. In our laboratory, the calibration cycle of Hcy test kit is short, 72 hours. And the calibration material of the project has five levels, which will increase the cost of the laboratory and reduce the efficiency of the work. From above analysis, we decide to extend the calibration cycle of Hcy measurement system in our clinical laboratory.

The biochemical analyzer is Beckman Coulter AU5800, the Hcy reagent is Beijing Jiuqiang (lot: 19-0226), and the calibrator is Beijing Jiuqiang (lot: 18-1115). After calibration, two quality control samples (QC-1 and QC-2) and one clinical serum sample (CS-1) were tested 4 times respectively (2 times in the morning and 2 times in the afternoon). The determination lasted for seven days. The difference between the

**Table 1:** Analysis of Hcy test data.

Sample	Mean	SD	CV (%)	Max	Min	Bias (%)	Standard (%)
QC-1	11.3	0.22	1.91	11.0	11.7	6.36	10
QC-2	30.2	0.42	1.40	29.1	31.1	6.87	10
CS-1	7.2	0.22	3.12	6.9	7.5	8.69	10

maximum and minimum values of the same sample should be less than the bias required by external quality assessment (EQA) of National Center for Clinical Laboratories (NCCL). The result is listed in Table 1. We can find that the difference between the maximum value and the minimum value in these seven days is less than 10%.

By extending the Hcy calibration cycle, the 72 hours given by the manufacturer were extended to 7 days. The new calibration cycle can significantly reduce the cost of the laboratory and improve the work efficiency. Therefore, other biochemistry essays in the laboratory can also use this method to extend the calibration cycle.

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## References

- Setien-Suero E, Suarez-Pinilla M, Suarez-Pinilla P, Crespo-Facorro B, Ayesa-Arriola R (2016) Homocysteine and cognition: A systematic review of 111 studies. *Neurosci Biobehav Rev* 69: 280-298. [[crossref](#)]
- Jakubowski H (2019) Homocysteine Modification in Protein Structure/Function and Human Disease. *Physiol Rev* 99: 555-604. [[crossref](#)]

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