

Comparison of the Falling Drop Method to Existing Hemoglobin Methods

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ABSTRACT

Anemia continues to be a major global health problem, and the World Health Organization estimates that about 2 billion people (25% of the world's population) have some form of anemia, the majority of which tends to be in underdeveloped countries. Current methods of quantitating total blood hemoglobin are unsuitable for routine use in laboratories and clinics in underdeveloped countries attributed to the lack of sufficient funding; reliable source of electricity, batteries, or instrument repair; adequate training of laboratory staff; and proper waste disposal. Our laboratory developed a simple and inexpensive method to measure hemoglobin, the Falling Drop Method, that does not require electricity or batteries and has low toxicity. The Falling Drop Method allows for hemoglobin measurements in clinics with limited financial means and without electricity. The method was also

designed to be used in conjunction with Sickle Confirm, a method developed in our laboratory to identify and determine sickle cell zygosity. The Falling Drop Method will allow Sickle Confirm to be used in clinics without the financial or electrical means to measure hemoglobin or hematocrit. A previous correlation study conducted in our laboratory showed good correlation of the Falling Drop Method ($R^2 = 0.908$) to the gold standard method (Sysmex KX-21N), but not as good as other point-of-care devices (Hemocue 201+: $r^2 = 0.992$ and Mission Plus: $r^2 = 0.978$). Modifications were made to the Falling Drop Method to extend the column length, and repeat correlation studies are underway, concluding on May 1, 2018. Preliminary data suggest an improved correlation to the Sysmex KX-21N.

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