

DETERMINATION OF HEMOGLOBIN BY PULS-OXIMETRY, A NONINVASIVE METHOD

A. Olteanu*, D. Vuculescu*, M. Dobreanu**

*Bucharest Blood Transfusion Centre,

**National Institute of Hematology and Blood Transfusion

Puls-oximetry is a noninvasive method which allows monitoring the levels of oxygen in the patient's hemoglobin.

This is an optical method – a sensor is placed on a thin segment of the patient's body, previously selected on the thumb. A beam of red light and infrared light of a certain wave length is sequentially passed from one side to the other, through a photo detector.

The change in absorption for each of the two wavelengths is measured allowing thus the determination of the level of absorption in the arterial pulse.

As evidence of the change in absorption there will be a difference in color between bound oxygen (bright red) and non bound oxygen (dark red or blue) in severe cases.

In this situation, the blood hemoglobin can be measured, for example, 100 molecules of hemoglobin are bound to the oxygen molecules.

The noninvasive system of hemoglobin testing has been evaluated as a screening application for blood donors before blood donation.

The evaluation procedure included a noninvasive measurement by using the Orsense system for the thumb and two biologic invasive samples: venous blood analyzed on a Nihon-Kohden item, representing the reference “gold standard” and capillary blood analyzed with Hemocue 201.

Conclusions: The values obtained as a result of testing the three methods mentioned above ranged within an error of 0, 68g/dl-0, 85g/dl, and the accuracy (defined as the standard deviation of error) ranged between 0, 81g/dl-0,89g/dl.

We consider that the concept of Next Generation and the puls-oximetry technology could be of great help in making decision in medical screening and diagnose within the field of hematology.