Clinical Evaluation of Accuracy of Masimo LNOP Blue Sensor in Cyanotic Infants.

Introduction
Recently, pulse oximetry provides for patient safety as a noninvasive monitoring. However it is extremely difficult to measure how saturation values (<70%) with accuracy with a conventional pulse oximeter. The infants with chronic heart disease (CHD) are often kept at low saturation levels in order to maintain cardiac output and perfusion. Therefore it is strongly desired by clinicians to accurately monitor SpO2 by pulse oximetry. WE have evaluated the new sensor "LNOP Blue" sensor (Masimo Corp) which has high accuracy for low saturation values and compared it to a typical LNOP (Masimo) sensor and an OxiMax sensor. (Nellcor, Tyco).

Methods
Infants with CHD who were scheduled for pulmonary artery banding procedure were studied. All of the standard anesthesia monitors were applied and in addition pulse oximeter sensors (LNOP Blue, LNOP Neo-L and OxiMax) were applied to appropriate sites and connected to oximeters (Masimo SET Radical and Nellcor 550 Plus respectively). Following the induction of general anesthesia, all pulse oximeter data was recorded to a laptop computer every 2 seconds (Oxilog V#0.72). Arterial blood was sampled every 20 minutes for the duration of the case and analyzed by CO-Oximetry (ABL735/Radiometer). Statistical analysis was performed using Pearson's correlation coefficient and bias and precision were calculated using methods of Bland and Altman.

Results
All data presented as mean and SD. After obtaining informed consent from parents, a total of 45 ABG samples were obtained from 6 infants, weighing 2.5 +/- 0.7 kgs, with mean core body temperature of 36.8 +/- 0.7 C. For specific sensor performance data see Table 1 below.

	LNOP Blue (Masimo)	LNOP Neo-L(Masimo)	OxiMax (Nellcor)
Bias	0.83	7.83	8.24
Precision	2.16	4.57	4.23
Regression equation	= 1.09 *-2.7	=1.44 * -44.0	=1.51 * -49.2
Correlation Coefficient	0.91	0.81	0.80

Discussion
Monitoring for CHD infants as extremely difficult and in order to determine accurate oxygen saturation levels, we needed in the past to rely on the arterial blood analyzer. LNOP Blue sensor can be a solution for monitoring accurate low saturation levels. Accurate noninvasive monitoring can reduce the number of drawing arterial blood; can also reduce the risk of infection related to blood drawing. However we need to be careful to evaluate the SpO2 values by pulse oximetry which can be affected by the movement of oxygen dissociation curve and the environmental factors. In conclusion, monitoring SpO2 continuously and accurately in cyanotic infant group is very significant.