Intraoperative Use of Forehead Reflectance Oximetry in Pediatric Patients.
Mahajan A., Lee E., Callon-Moldovan A. *Proceeding of the 2004 Society for Technology in Anesthesia.* 2004; Abs 16.

Pulse oximetry is the standard of care in both the operating room and the ICU. Technological development continues to seek an ideal probe that is accurate, convenient, portable an easily accessible. In response, the Max Fast sensor that utilizes reflectance technology, for use on the forehead has been developed. The purpose of this study is to evaluate the accuracy of the new Max-Fast sensor on pediatric intraoperative surgical patients by comparison with two digital sensors with established reliability.

Following IRB approval, twenty pediatric surgical patients, undergoing general anesthesia were enrolled. Three pulse oximeter probes of appropriate size based in manufacturer's recommendations were attached for comparison; Nellcor N595 via a Max Fast reflectance forehead sensor, Nellcor N200 via a digit sensor and Masimo SET Radical via a LNOP digit sensor. The two digit sensors were optically shielded from one another. The SpO2 and PR values were recorded digitally at a frequency of 1 Hz. The mean as well as the bias and precision of the two digit sensors were calculated. Error was defined as the difference between the forehead sensor and the mean of the two digit sensors during stable patient conditions. The mean (± SD) error and the E5 (% time the error was >5% in stable conditions) were calculated for the forehead sensor.

Data is presented in tables below.

	Bias - Digits	Precision - Digits	Bias - Forehead	Precision - Forehead	E5 (minutes)
Mean	-0.3	0.75	-5.15	3.33	34
SD	0.85	1.11	4.47	2.60	46.1

This study demonstrates poor performance of the forehead reflectance pulse oximeter. In our patients, the Max- Fax sensor attached to the N595 oximeter demonstrated an unacceptable bias and precision and was in error by more than 5% for more than 20% of the total operative time on eleven (55%) of the cases studied, suggesting the Max-Fast forehead sensor and the N595 oximeter is not accurate nor reliable enough for clinical use in pediatric surgical patients.