

Novel Pulse Oximeter Technology Resistant to Noise Artifact and Low Perfusion.

Goldstein M.R., Martin G.I., Sindel B.D., Cunningham M.D. *Am J Respir Crit Care Med.* 1997;155(4):A712.

Pulse oximetry determines oxygen saturation by comparing absorbance of light during blood flow. Problems include monitoring during low perfusion, motion, light and vibration artifact. Masimo SET (Signal Extraction Technology) calculates a noise reference and uses an adaptive filter to cancel interfering artifact. This eliminates noise in the desired signal, resulting in a “clean” waveform. This study evaluates SET and traditional oximeter technology.

Thirteen neonates <12 hours, 400 – 5,000 grams and gestation 22-42 weeks participated. Masimo and Nellcor technologies were attached to different post-ductal limbs. Heart rate (HR) and saturation were validated. Blood gas results were analyzed. Potential error rate was HR<100. Potential failure rate was 100>HR>0. No patient has HR<112 by ECG monitoring. In two cases, low perfusion precluded transduction with Nellcor oximetry (hypoplastic left heart and severe sepsis).

	Masimo SET	Nellcor N-200
Average Pulse Oximetry	98.4 ± 4.4	91.0 ± 7.7
Average Heart Rate	145 ± 15	141 ± 19
Potential Error Rate	1.4 ± 1.3%	5.8 ± 7.3
Potential Failure Rate	1.0 1.3%	3.5 ± 3.7%

While SpO₂ differences may not be statistically significant, motion artifact drives conventional pulse oximeters <85 with underestimation of oxygenation and falsely influences an increase in O₂ titration. Masimo SET significantly improves extraction of arterial oxygen status in pulse oximetry during motion and low perfusion.