

Motion Performance Comparison of New Generation Pulse Oximeters Using BioTek Index 2 P Simulator

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INTRODUCTION

New generation pulse oximeters claim improved performance during difficult monitoring conditions of motion and low perfusion. The purpose of this paper is to summarize testing that compares the motion performance of two latest generation pulse oximeters.

METHODS

The motion performance of the Masimo SET Radical (V3.1) and Nellcor N-595 (V2.4.5.0) were assessed using the preset motion simulations of the BioTek Index 2 P (V2.04). The displayed saturation and pulse rate from each instrument was compared to the simulator settings.

RESULTS

The results of the BioTek motion performance comparison are shown in Table I.

Motion Performance Comparison Masimo SET Radical and Nellcor N-595						
Preset Simulation Setting	Simulator Setting		Masimo SET		Nellcor N-595	
	Saturation %SpO ₂	Pulse Rate BPM	Saturation %SpO ₂	Pulse Rate BPM	Saturation %SpO ₂	Pulse Rate BPM
Normal + Tap	98	55	98	55	81	0
Normal + Shiver	98	55	98	55	78	0
Weak + Tap	90	95	90	95	0	0
Weak + Shiver	90	95	90	95	66	0
Brady + Shiver	88	45	88	45	71	0
Hypoxic + Tap	70	95	70	95	60	0
Hypoxic + Shiver	70	95	70	95	57	0
Neonate + Shiver	90	180	90	180	73	0
RMS Accuracy			0	0	17.4	n/a
Failure Rate			0	0	12.5%	100%

Table I: Motion Performance Comparison

DISCUSSION/CONCLUSIONS

The Masimo SET instrument accurately reported the saturation and pulse rate values generated during motion conditions by the BioTek Index 2 signal generator/simulator. The Nellcor N-595 showed significant saturation errors and complete pulse rate failure in all trials. The Nellcor N-595 did not meet the accuracy specification by as much as 22 % SpO₂.