

ABSTRACT SUPPLEMENT

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Residual Free Hemoglobin in Perioperatively Salvaged Blood: Results with a New Point-of-Care Test

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Background: Removal of free hemoglobin (Hb) is one way to assess the ability of blood salvage devices to remove supernatant materials. However, free Hb in salvaged blood frequently exceeds the measuring range of standard plasma Hb methods. In 1993, our program implemented the HemoCue® TUR-Hemoglobin method since its measuring range of 0-3000 mg/dl encompasses expected values in salvaged blood. Recently, a newer method, HemoCue® Plasma/Low Hb, became available and a method comparison study was performed. Methods: Duplicate serial dilutions of laboratory-prepared samples containing calculated amounts of free Hb (mg/dl) were analyzed by the HemoCue® Plasma/Low Hb, HemoCue® TUR Hb, and modified Harboe methods. In 25 cardiovascular (CV) and orthopedic (ORT) cases, salvaged blood supernatant samples, both pre- and post- processing, were filtered (0.2 mm, due to sample turbidity) and analyzed on both HemoCue devices. Results: The HemoCue® Plasma/Low Hb method demonstrated excellent agreement with expected Hb levels in the serial dilutions. In the salvaged blood samples, its performance was similar to TUR Hb ($r=0.9824$). Conclusion: Free Hb measurements with the HemoCue® Plasma/Low Hb method are accurate and applicable to quality control of perioperatively salvaged blood and blood salvage device assessment.

Serial Dilution and Operating Room Test Results (mg/dl)				
	Expected Hb	HemoCue Plasma/Low Hb	HemoCue TUR Hb	Harboe Hb
Serial Dilution	1000	965 ± 21.2	933 ± 13.4	740 ± 9.3
	500	490 ± 0.0	452 ± 14.1	362 ± 16.8
	250	240 ± 0.0	212 ± 0.0	194 ± 0.5
	125	125 ± 7.1	77 ± 0.0	99 ± 1.8
	62.5	60 ± 0.0	20 ± 0.0	51 ± 1.1
r =		0.9997	0.9997	0.9994
regression formula		$y = 0.96x + 2.08$	$y = 0.97x - 38.7$	$y = 0.73x + 5.9$
OR Processing	CV Pre-processing	CV Post-processing	ORT Pre-processing	ORT Post-processing
range	50 - 930	30 - 450	640 - 1410	160 - 720
n, mean difference ± SD	19, -40.2 ± 105.2	15, 6.0 ± 37.8	7, -78.1 ± 105.6	7, -7.7 ± 16.4

Serial dilution values given as mean ± SD