

Multicenter Study Evaluates the Trend Accuracy of Masimo Continuous SpHb®



[Masimo](#) has announced the findings of an abstract presented at the International Anesthesia Research Society (IARS) Annual Meeting in Washington, DC. In the multicenter study, researchers at three academic medical centers evaluated the trend accuracy of noninvasive, continuous hemoglobin monitoring (SpHb®).¹

The prospective observational study was a collaboration among Drs. Richard Applegate and Patricia Applegate of the University of California, Davis; Dr. Maxime Cannesson of the University of California, Los Angeles; and Drs. Prith Peiris, Beth Ladlie, and Klaus Torp of the Mayo Clinic in Jacksonville, Florida.

The researchers enrolled 135 adult patients who were scheduled for surgery with planned arterial catheter placement and continuous SpHb monitoring. Each time a blood sample was obtained, the researchers recorded SpHb using a Masimo Radical-7® Pulse CO-Oximeter® with Masimo rainbow® ReSposable R125 sensors (Revision K; same algorithm as Revision L). They also analyzed each blood sample twice to determine clinical laboratory hemoglobin (tHb; Sysmex 550 or Coulter LH 750), arterial blood gas CO-oximeter hemoglobin (ABGHb; Radiometer ABL800, Nova Biomedical CCX or PhOX, or Siemens RAPIDLab 1265), and point-of-care hemoglobin (aHQHb; HemoCue HB 301).

To assess overall trend accuracy and trend accuracy within defined ranges, the researchers analyzed the correlation of change in tHb to changes in SpHb, ABGHb, and aHQHb. Trend bias within 10% of tHb was considered clinically equivalent. The researchers found that “The confidence intervals for the proportion of samples with trend bias within 10% of tHb overlapped for SpHb (372 of 416 trends; 89.4%; 86.1% to 92.2%), ABGHb (391 of 416 trends; 94.0%; 91.3 to 95.9%) and aHQHb (406 of 416 trends; 97.6%; 95.6 to 98.7%).”

The researchers concluded that “SpHb, ABGHb and aHQHb appear to provide similar intraoperative guidance regarding tHb increase or decrease. Continuous noninvasive SpHb changes larger than ± 0.5 g/dL could provide a reasonable indication for the clinician to obtain a confirmatory blood sample for Hb measurement, but not replace such measurement in guiding transfusion decision making. The transfusion impact of continuous hemoglobin trend monitoring should be studied.”

SpHb monitoring may provide additional insight to the directional trend of hemoglobin between invasive blood samplings – when the SpHb trend is stable and the clinician may otherwise think hemoglobin is decreasing; when the SpHb trend is rising and the clinician may otherwise think hemoglobin is not rising fast enough; or when the SpHb trend is decreasing and the clinician may otherwise think hemoglobin is stable. Clinical decisions regarding red blood cell transfusions should be based on the clinician’s judgment considering, among other factors: patient condition, continuous SpHb monitoring, and laboratory diagnostic tests using blood samples.

The study was supported by research grants from Masimo to Loma Linda University, Mayo Clinic in Florida, and the University of California, Irvine.

Reference

1. Applegate R, Cannesson M, Applegate P, Peiris P, Ladlie B, and Torp K. Hemoglobin Change Measurement Accuracy Obtained from 3 Devices During Surgery. Proceedings from the 2017 IARS Annual Meeting, Washington, DC. Abstract #A1786.

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