

New Study Reveals Startling 28% Increase in Significant Bleeding of Mothers After Delivery

Data Supports Recent Call by Joint Commission to Change Current Practices

Irvine, California – A new study of U.S. maternal outcomes after vaginal and cesarean deliveries published in the May 2010 issue of *Anesthesia & Analgesia*, a peer-reviewed academic journal, shows that between 1995 and 2004, postpartum hemorrhage (excessive blood loss after delivery) increased 28% in prevalence.¹ Postpartum hemorrhage is one of today's most common complications for delivering mothers that according to the study, "markedly increases the odds of in-hospital mortality" and causes 19% of in-hospital maternal deaths. In support of this and other recent data, earlier this year the Joint Commission issued a sentinel event alert calling for protocols and training to improve the ability to detect hemorrhage and other conditions that put mothers at high risk.

In the study, researchers from the Massachusetts General Hospital, Harvard Medical School, and Columbia University College of Physicians and Surgeons used the largest U.S. database of hospitalizations to define and assess trends and risk factors in the incidence of postpartum hemorrhage. Their analysis included discharge datasets from 876,641 hospital admissions for obstetric deliveries in 2004, revealing that postpartum hemorrhage occurred in 25,654 cases, at a rate of 3 per 100 deliveries. Changes in both obstetric practice and maternal demographics in the U.S.—including the increased rate of cesarean delivery, larger proportion of multiple gestation births, and advanced maternal age—may be contributing factors for this deadly trend.

The increase in postpartum hemorrhage was primarily due to an increase in uterine atony—accounting for 79% of all cases. Uterine atony—failure of the uterus to contract maximally after delivery of the baby and placenta—results in heavy uterine (internal) bleeding that can be difficult to identify after delivery (postpartum). Unlike other maternal and fetal risk factors that predispose high-risk deliveries, such as abnormal placentation, which can frequently be identified by predelivery imaging and triaged accordingly, uterine atony does not have identifiable antepartum risk factors and cannot be identified before delivery—making it more difficult to detect and treat. Because of this, patients who hemorrhage from uterine atony (with severity significant enough to require transfusion) represent the greatest challenge to anesthesiologists and obstetricians.

According to researchers: "Because prompt recognition and resuscitation may limit the morbidity and mortality associated with postpartum hemorrhage, ^{2,3} our results suggest that anesthesiologists practicing in all labor and delivery settings need to have systems in place to manage these patients." Study findings also showed that "postpartum hemorrhage is more common among patients delivering at hospitals in the bottom quartile for delivery volume compared with those delivering at hospitals in the top quartile" and since both anesthesiologists and obstetricians often cover multiple hospitals, researchers cite a need for prudent establishment of "protocols to expedite access to blood products and additional trained personnel."

Based on the increasing risk and growing tragedy of preventable maternal deaths, industry standards and guidelines are also calling for the assessment of key indicators and early warnings signs of hemorrhage during and after delivery. Earlier this year in a Sentinel Event Alert, The Joint Commission warned of this disturbing trend and the increasing rate of maternal mortality.⁴ Citing the leading cause of maternal death as hemorrhage, the Joint Commission calls out its 2010 standards as a key opportunity for preventing maternal deaths. The Joint Commission Provision of Care, Treatment and Services Standard PC.02.01.19 requires hospitals to: 1) Have a process for recognizing and responding as soon as a patient's condition appears to be worsening; 2) Develop written criteria describing early warning signs of a change or deterioration in a patient's condition and when to seek further assistance; 3) Based on the hospital's early warning criteria, have staff seek additional assistance when they have concerns about a patient's condition; 4) Inform the patient and family how to seek assistance when they have concerns about a patient's condition. Additionally, last year the California Maternal Quality Care Collaborative (CMQCC) released the Obstetric Hemorrhage Care Guidelines Checklist recommending pre-screening, ongoing risk assessment for hemorrhage, and ongoing quantitative evaluation of blood loss on every birth.⁵

Brian Jones, M.D., Medical Director of OB Anesthesia at Sutter Medical Center in Sacramento and Assistant Professor of Anesthesiology at the University of California-Davis, says that: "This study provides strong evidence of a growing deadly trend—the frequency of serious maternal postpartum hemorrhage is increasing at an alarming rate. Having established protocols in place, such as the CMQCC Obstetric Hemorrhage Care Guidelines, will help physicians and hospitals to have an organized approach for dealing

with maternal hemorrhage. And today, new technologies like Masimo noninvasive and continuous hemoglobin (SpHb) offer the opportunity to provide more vigilant and proactive care because it allows clinicians to quickly measure current hemoglobin levels and continuously track them in real-time to detect falling hemoglobin levels that represent an early sign of a potential hemorrhage. With SpHb, clinicians have the ability to detect hemoglobin changes earlier, so they can intervene sooner to help protect delivering mothers from the disastrous consequences of postpartum hemorrhage."

Maternal bleeding is typically discovered after a significant change in vital signs, signs, and/or symptoms, and then confirmed with an invasive laboratory hemoglobin test. This approach can result in late detection of bleeding that can affect patient outcome. Masimo Rainbow SET Pulse CO-Oximeters provide the first-and-only continuous and noninvasive hemoglobin (SpHb) measurements, which can help clinicians quickly identify significant changes hemoglobin levels. When used with other clinical variables, Masimo SpHb may help clinicians assess anemic status and help determine treatment and additional test options.

Madhava Karunaratna, MD, an OB/GYN at Balangoda Hospital in Sri Lanka, stated: "In cases of severe hemorrhaging during and after childbirth, SpHb has enabled us to immediately identify and continuously assess blood loss severity to better manage internal bleeding, prevent overloading of fluid, and decrease maternal death."

Masimo Rainbow SET Pulse CO-Oximetry is a breakthrough noninvasive blood constituent monitoring platform measuring multiple blood constituents that previously required invasive procedures, including: total hemoglobin (SpHb®), oxygen content (SpOC™), carboxyhemoglobin (SpCO®), methemoglobin (SpMet®), PVI®, acoustic respiration rate (RRa™), oxyhemoglobin (SpO2), pulse rate (PR), and perfusion index (PI). Masimo SpHb, PVI, and SpO2 have been shown in multiple clinical studies to provide accurate, reliable, real-time measurements that help clinicians to proactively monitor and manage hemoglobin, fluid, and oxygen saturation levels.

1 Bateman BT, Berman MF, Riley LE, Leffert LR. "The Epidemiology of Postpartum Hemorrhage in a Large, Nationwide Sample of Deliveries" *Anesth Analg* May 2010 110:1368-1373. Available online [here](#).

2 Mercier FJ, Van de Velde M. "Major Obstetric Hemorrhage." *Anesthesiol Clin* 2008;26:53-66.

3 Mahutte NG, Murphy-Kaulbeck L, Le Q, Solomon J, Benjamin A, Boyd ME. "Obstetric Admissions to the Intensive Care Unit." *Obstet Gynecol* 1999;94:263-6.

4 The Joint Commission, "Sentinel Event Alert: Preventing Maternal Death" Issue 44, January 26, 2010. Available online [here](#).

5 California Maternal Quality Care Collaborative (CMQCC) "Obstetric Hemorrhage Care Guidelines Checklist." Available online [here](#).