

# Calibrated Drapes May Aid Blood-Loss Estimates

*Estimate error was reduced from more than 30% to less than 10% in one study.*

BY SHERRY BOSCHERT  
San Francisco Bureau

SAN FRANCISCO — There's a product niche waiting to be filled, one that might save a life during postpartum hemorrhage.

Health care providers consistently underestimate the amount of postpartum blood loss, and adding calibrations to vaginal delivery drapes could improve blood loss estimates, results of a randomized crossover study suggest.

Participants who viewed calibrated delivery drapes and then were asked to estimate the amount of blood in uncalibrated drapes reduced the error in their

estimates from more than 30% to less than 10% for the highest volumes of blood, Robert J. McCarthy, Pharm.D., said in a poster presentation at the annual meeting of the American Society of Anesthesiologists.

There are no vaginal delivery drapes on the market calibrated to indicate the amount of blood loss, added Dr. McCarthy of Northwestern University, Chicago. "It's time consuming to go through and set these up [individually]," he said. If such a product became available, it "could prevent delay in diagnosis and treatment of postpartum hemorrhage."

The investigators asked 42 obstetricians, 21 nurses, and 43 anesthesiologists to estimate blood loss at eight mock vaginal delivery stations, four with uncalibrated delivery drapes and four with drapes that were marked at 500-mL increments up to 2,500 mL.

Each set of delivery drapes contained expired packed red blood cells diluted to a hematocrit of 33%, in volumes of 300, 500, 1,000, or 2,000 mL, plus 100 mL of urine and 5, 10, or 15 surgical sponges.

Subjects were randomized to view the calibrated or uncalibrated drapes first, then crossed over to the other group of stations.

Viewing the uncalibrated drapes first produced greater un-

derestimates of blood loss that worsened with larger volumes of blood loss, reported Dr. McCarthy, lead investigator Dr. Paloma Toledo, and their associates. All the authors are from Northwestern University.

Errors by those who first viewed uncalibrated drapes ranged from a 16% underestimate of the 300-mL blood volume to a 41% underestimate of the 2000-mL volume.

Subjects who first viewed the calibrated drapes underestimated volumes in the uncalibrated drapes by less than 15%.

The results did not differ by the type of health care provider, the level of training, or number of years of experience.

A previous study reported that estimates of postpartum blood

loss based on visual assessment underestimated blood loss by 33%-50% compared with photo-spectrometry, "which is the gold standard for this," Dr. McCarthy said (*Int. J. Gynecol. Obstet.* 2006; 93:220-4).

"They used smaller amounts of blood loss—300 mL as their top volume—while we used volumes that were more likely to be clinically important and need some kind of intervention."

Another previous study reported that estimates of blood loss worsen with increasing volumes of blood loss (*Int. J. Gynecol. Obstet.* 2000;71:69-70).

Blood loss greater than 500 mL after vaginal delivery (postpartum hemorrhage) is a major cause of maternal morbidity and mortality. ■

## Some Risks Lower in Planned C-Section vs. Vaginal Delivery

BY DAMIAN McNAMARA  
Miami Bureau

HOLLYWOOD, FLA. — Planned cesarean deliveries are associated with a lower risk for chorioamnionitis and postpartum hemorrhage, compared with planned vaginal births, and are not associated with a higher risk for transfusion, venous thromboembolism, or wound infection, according to a retrospective study of low-risk women.

Perhaps not surprisingly, however, planned cesarean delivery is associated with a longer average stay in the hospital, Dr. Elizabeth J. Geller said at the annual meeting of the American Urogynecologic Society.

Dr. Geller presented results of a review of deliveries by healthy, primiparous women. Planned cesarean was associated with significantly lower risk of prolonged rupture of the membranes (2% vs. 18% in the planned vaginal group); chorioamnionitis (2% vs. 17%), and postpartum hemorrhage (1% vs. 6%).

However, the women in the planned cesarean group had a significantly longer stay in the hospital (3.2 days vs. 2.6 days).

After controlling for age, race, obesity, gestational age, and prolonged rupture of the membranes, the risk of chorioamnionitis (odds ratio, 0.2) and postpartum hemorrhage (OR, 0.2) were significantly lower in the planned cesarean group, said Dr. Geller of the University of North Carolina at Chapel Hill.

Transfusion, cesarean hysterectomy, venous thromboembolism, and wound infection rates were not significantly different between groups.

There were no maternal deaths or pulmonary emboli in either group.

Dr. Geller and her associates at the univer-

sity reviewed 26,356 deliveries by healthy, primiparous women from 1995 to 2005 in their institution's perinatal database. They excluded high-risk deliveries, including multiparous women, multiple gestations, and premature births.

"This left us with a low-risk population," said Dr. Geller, a clinical fellow in female pelvic medicine in the division of urogynecology and reconstructive pelvic surgery.

The researchers compared rates of chorioamnionitis, postpartum hemorrhage, and transfusion between 3,868 planned vaginal deliveries and 180 planned cesarean deliveries.

The women in the vaginal group were more likely to be younger (25 years vs. 28 years), but "the absolute values were close so this difference is not clinically relevant," Dr. Geller said.

In addition, women in the planned cesarean group delivered earlier, at a gestational age of 38.7 weeks, compared with 39.4 weeks in the planned vaginal group.

Although there were no differences between groups in terms of obesity or black race, women in the planned cesarean group were more likely to be white (59% vs. 43%) or Asian (10% vs. 5%), and less likely to be Hispanic (21% vs. 37%).

The intent-to-treat study design and inclusion of a decade's worth of data for a large hospital database are strengths of the research, Dr. Geller said.

Possible limitations include its retrospective nature, inclusion of only low-risk women, and a lack of outcomes data following hospital discharge.

A meeting attendee pointed out that all the findings addressed maternal and not newborn outcomes.

"Stay tuned," Dr. Geller replied. ■

## Elective C-Section Linked to Infant Respiratory Problems

BY JONATHAN GARDNER  
Contributing Writer

Elective C-section increases by up to fourfold the risk of respiratory morbidity in babies who were delivered at 37-39 weeks of gestation, compared with babies who were delivered vaginally or by emergency C-section at the same gestational age.

That finding—from a Danish cohort study of 34,458 singleton deliveries—suggests that elective C-section should wait until after the 39th week, the study investigators wrote online in *BMJ*.

"Carrying out elective caesarean sections at greater gestational ages may, however, result in higher rates of intrapartum caesarean sections because some women would go into spontaneous labour (in our population, 25% of spontaneous intended vaginal deliveries started before 39 weeks' gestation)," wrote Anne Kirkeby Hansen of the Aarhus (Denmark) University Hospital and associates.

"Compared with elective caesarean sections, intrapartum caesarean sections may carry an increased risk of complications such as uterine rupture in women with previous caesarean section, infections, or even maternal mortality."

The risk of respiratory morbidity (transitory tachypnea of the newborn, respiratory distress syndrome, persistent pulmonary hypertension of the newborn) was increased in babies delivered by elective C-section at 37 weeks (odds ratio 3.9), 38 weeks (OR 3.0), and 39 weeks (OR 1.9), compared with newborns intended for vaginal delivery.

Risk was not increased at 40 weeks (OR 0.9).

The data were adjusted for factors such as smoking and parity, the study authors reported (doi:10.1136/bmj.39405.539282.BE).

The analysis included all liveborn singletons born without malformation between 37 and 41 weeks' gestation at one institution between 1998 and 2006.

In all, 2,687 liveborn babies were delivered by elective C-section and 2,877 were delivered by emergency C-section. The remaining babies were born vaginally.

A total of 1.8% of all babies had a respiratory problem, with 0.2% of them having serious respiratory morbidity (a condition requiring treatment for at least 3 days with continuous oxygen supplementation, nasal continuous positive airway pressure, or any period of mechanical ventilation).

The relative risk for serious respiratory morbidity was increased in those delivered by elective C-section at 37 weeks (OR 5.0) and 38 weeks (OR 4.2), compared with intended vaginal delivery.

At 39 weeks, the odds ratio was 2.4, but this increase in risk was not statistically significant.

The authors said hormones released during normal vaginal delivery may help prevent respiratory problems.

Catecholamines are present in the fetus during normal vaginal delivery in response to the rupture of membranes and labor, a phenomenon that may decrease the secretion of fetal lung liquid, increase its absorption, and stimulate the release of surfactants. ■