Evidence-based treatments for obstetric hemorrhage save lives and lower hospital costs, shows study

February 27 2023, by Erin Digitale

Credit: AI-generated image (disclaimer)

Measures used at California hospitals to stop excessive bleeding in childbirth are saving an average of almost $18 per birth, for statewide annual health care savings of $9 million, according to new research by scientists at Stanford Medicine and the California Maternal Quality Care

Collaborative.

Most of the savings come from preventing emergency hysterectomies because hemorrhages during childbirth can be quickly stopped, the study found.

The research, published this month in *Obstetrics and Gynecology*, examined the financial impact of equipping hospitals with a toolkit composed of evidence-based measures for treating severe bleeding during birth, also known as obstetric hemorrhage. The toolkit, introduced in 2010, is now used at nearly all California hospitals where babies are born. The research team looked at the bottom-line balance of expenditures and savings from implementing the toolkit, as well as its cost-effectiveness, which accounts for the financial value of its effect on patients' well-being.

Using the toolkit saved hospitals money and was cost effective, the researchers found.

"Quality improvement efforts in maternity care not only save lives; they can save costs," said study co-author Elliott Main, MD, clinical professor of obstetrics and gynecology at Stanford Medicine and medical director of the California Maternal Quality Care Collaborative.

The study's lead author is Erik Wiesehan, graduate student in health policy. Its senior author is Jeremy Goldhaber-Fiebert, Ph.D., professor of health policy.

The savings applied in both large and small hospitals, and the toolkit was more cost-effective in smaller hospitals, the research team found.

"We can now say to hospital administrators, "Not only is this the right thing to do because you can save lives, but it will in fact save you

money,'" Main said.

Better, more equitable hemorrhage treatment

Obstetric hemorrhage is one of the top complications of childbirth, as well as a major cause of other medical problems, such as emergency hysterectomy and maternal death, worldwide. The collaborative, composed of experts from around the state who research ways to improve pregnancy and childbirth care, developed its obstetric hemorrhage toolkit to provide hospitals with a detailed set of evidence-based medical practices for treating these hemorrhages.

The toolkit includes recommendations for training labor and delivery staff to recognize and treat hemorrhages, including formal protocols and checklists; information about medical conditions that raise hemorrhage risk in pregnancy and birth; and directions for equipping a "hemorrhage crash cart" with supplies for hemorrhage treatment, such as special sutures, intra-uterine compression balloons, lights and instruments, and medications.

Prior research showed that use of the toolkit significantly reduced severe medical complications among California patients who had obstetric hemorrhages. Implementing the toolkit also greatly reduced gaps in outcomes for mothers of different races, research found. The toolkit has contributed to California's success in reducing its maternal death rate, making the state an exception to nationwide trends of rising maternal mortality.

Saving hospitals money

The study used cost data from real-world implementation of the obstetric hemorrhage toolkit at hospitals around California. These costs were used

as inputs in a model that simulated a typical year of 480,000 births in California. In this model, 28,320 people giving birth experienced an obstetric hemorrhage. The model compared what would happen if all these individuals received care at hospitals that used the toolkit versus if none did.

With the toolkit in place, the model showed that across the state, there would be 5,518 events of life-threatening birth complications, 172 emergency hysterectomies and eight maternal deaths as a result of obstetric hemorrhage per year. Without the toolkit, there would be an additional 913 events of life-threatening birth complications, 28 additional emergency hysterectomies and one additional maternal death, all due to less-optimal care for obstetrical hemorrhage.

The model showed that by preventing these additional bad outcomes, the toolkit saves an average of $17.78 per birth, for all 480,000 births. The savings come largely from prevention of emergency hysterectomies for patients who receive rapid, effective hemorrhage treatment.

Using the toolkit prevents the loss of 182 quality-adjusted life years for California's new mothers, the study also found. Quality-adjusted life years are a measure of patients' well-being. Patients who have emergency hysterectomies after giving birth often report worse quality of life due to physical and emotional recovery from the procedure and from the unplanned loss of their fertility.

The financial savings in the analysis do not account for all possible savings from averting mental health challenges in new mothers, as these savings are difficult to estimate accurately, according to the researchers.

"If anything, our findings are an underestimate because they are focused on the outcomes we had the strongest cost estimates for," Main said. "For example, we don't have good estimates of the costs of mental health

problems related to severe events, even though we know they exist."

Because the balance of costs and benefits for implementing the toolkit can depend on the size of hospital—larger hospitals having higher staff-training costs, while smaller hospitals have fewer births to spread the fixed costs—the research team repeated their analyses by hospital size. They found that the toolkit was most cost-effective in the hospitals with the smallest number of births, fewer than 1,000 per year.

"I was surprised that the toolkit was more cost-effective in small hospitals, and very pleased we could show that there were modest cost savings," Main said.

The statewide collaborative is currently conducting projects focused on improving equity in labor and delivery care, as well as improving care for anemia, a pregnancy complication that disproportionately affects Black women, and in reducing C-sections for first-time mothers.

More information: Erik C. Wiesehan et al, State Perinatal Quality Collaborative for Reducing Severe Maternal Morbidity From Hemorrhage, *Obstetrics & Gynecology* (2023). DOI: 10.1097/AOG.0000000000005060

Provided by Stanford University