The goal of all labor and delivery units and of birthing centers is a safe birth for both newborn and mother. Yet, an examination of current statistics raises significant questions about whether that aim is being achieved. A report released this year found that more than 2 women die of pregnancy-related causes every day in the United States, with the maternal mortality ratio doubling from 6.6 deaths per 100,000 births in 1987 to 13.3 deaths per 100,000 births in 2006.1 This means that the likelihood of a woman dying in childbirth in the United States is 5 times as great as in Greece, 4 times as great as in Germany, and 3 times as great as in Spain.1 Maternal mortality rates in the state of California alone have nearly tripled from 1996 to 2006,2 rising to nearly 17 deaths per 100,000 live births in 2009. As serious as these statistics are, the study warns that the number of maternal deaths in the United States may actually be much higher because of a lack of federal reporting requirements and incomplete data collection at state and local levels.

Although the United States spends more than any other country on health care, and more on maternal health than any other type of hospital care,1 preexisting medical conditions such as high blood pressure are putting women at greater risk for death during or shortly after pregnancy.3 Achieving national goals of reducing the frequency of maternal death will require health care organizations and caregivers to have a thorough understanding of the underlying causes of maternal deaths, coupled with a disciplined focus on ensuring consistent excellence in the early recognition and management of complications of pregnancy, labor, and delivery.

THE PROBLEM

The most current statistics from the Centers for Disease Control and Prevention show that there are 13.3 maternal deaths per 100,000 live births,4 significantly beyond the target of 3.3 maternal deaths per 100,000 live births set as part of the US government’s Healthy People 2010 initiative.5 Attempts to identify preventable deaths and understand how to prevent them have yielded varying results; several studies determined that 28% to 50% of maternal deaths were preventable.6 8

In 2008, Hospital Corporation of America retrospectively evaluated 6 years of data on individual causes of maternal deaths among
The study concluded that the majority of the reviewed maternal deaths were not preventable but that the most common preventable errors were:

- failure to adequately control blood pressure in hypertensive women;
- failure to adequately diagnose and treat pulmonary edema in women with preeclampsia;
- failure to pay attention to vital signs following cesarean delivery; and
- hemorrhage following cesarean delivery.

In addition to the Hospital Corporation of America’s study of examination of causes, a recent study of US maternal outcomes after vaginal and cesarean deliveries showed that between 1995 and 2004, postpartum hemorrhage increased 28% in prevalence, causing 19% of in-hospital maternal deaths. Causes for this negative trend may include both obstetric practice and maternal demographics in the United States—including the increased rate of cesarean delivery, larger proportion of multiple gestation births, increased maternal obesity with its comorbidities, and advanced maternal age.

**RECOMMENDED IMPROVEMENT STRATEGIES**

The US maternal mortality increases have prompted federal and state governments as well as safety organizations such as The Joint Commission to step up efforts to identify the causes of preventable maternal deaths. Although some experts have pointed to improvements in the identification of maternal deaths and collection of maternal death data (along with changes in the population characteristics of pregnant women) as factors for the increase in maternal death rates, clinical factors must be studied and addressed.

Each case of maternal death needs to be identified, reviewed, and reported to develop effective strategies for preventing pregnancy-related mortality and severe morbidity. Nurses play a role in all patient safety efforts; they should be involved in efforts to enhance organizational performance, leading to reduced risks of maternal death. Areas that are particularly relevant to nursing include communication with patients about potential risks and risk-reduction activities; health education on high-risk factors during pregnancy, labor and delivery; and early, prompt recognition of symptoms indicating clinical demise. The Joint Commission has also formally encouraged participation by physicians, including obstetrician-gynecologists, in state-level maternal mortality review and collaboration with such review committees in sharing data and records needed for review. “Lessons learned” from reviewing these adverse events can help to teach others about preventing and managing high-risk situations.

Specifically, The Joint Commission has recommended the following suggested actions to help hospitals and clinicians prevent maternal death:

- Educate physicians, nurses, and other clinicians who care for women with underlying medical conditions about the additional risks that could be imposed if pregnancy were added; suggest how to discuss these risks with patients, including the use of appropriate and acceptable contraception, as well as preconceptual care and counseling.
- Communicate identified pregnancy risks to all members of the health care delivery team.
- Identify specific triggers for responding to changes in the mother’s vital signs and clinical condition; develop and use protocols and drills for responding to serious changes, such as hemorrhage and severe preeclampsia. Use the drills to train staff in the protocols, refine local protocols, and identify and fix systems problems that would prevent optimal care.
- Educate emergency department personnel about the possibility that a woman of childbearing age, whatever her presenting symptoms, may be pregnant or may have recently been pregnant. Many
maternal deaths occur before the woman is hospitalized or after she delivers and is discharged. These deaths may occur in another hospital or at home, away from the woman’s usual prenatal or obstetric caregivers. Knowledge of pregnancy may affect the diagnosis or appropriate treatment.

For women who are identified as being at high risk because of preexisting conditions such as high blood pressure, diabetes, or morbid obesity, The Joint Commission has recommended the following additional actions:

- Refer high-risk patients to the care of experienced perinatal care providers, with access to a broad range of specialized services.
- Make pneumatic compression devices available for patients undergoing cesarean delivery who are at high risk for pulmonary embolism.
- Evaluate patients at high risk for thromboembolism for low-molecular-weight heparin in postpartum care.

In addition to the specific recommendations, The Joint Commission urges hospitals to meet and exceed accreditation standards to improve safety for pregnant women. The Provision of Care, Treatment and Services Standard PC.02.01.19 requires the hospital to:

- have a process for recognizing and responding as soon as a patient’s condition appears to be worsening;
- develop written criteria describing early warning signs of a change or deterioration in a patient’s condition and when to seek further assistance;
- on the basis of the hospital's early warning criteria, have staff seek additional assistance when they have concerns about a patient’s condition; and
- inform the patient and the family how to seek assistance when they have concerns about a patient’s condition.

Organizations also should regularly study the literature and leading practices used by other facilities, as well as patient care management consistency, within their own organization for patients with similar clinical situations (eg, surgical patients). For example, unlike nearly all other adult patients undergoing major surgery, pregnant women undergoing cesarean delivery have traditionally not received prophylactic measures for the prevention of venous thromboembolism afforded to other surgical patients. Many hospital systems in California have now begun adopting venous thromboembolism prophylaxis measures, as well as comprehensive programs for addressing and responding to hemorrhage.

Finally, measurement is integral to a successful approach when solving the problem of preventable maternal deaths. It is only by measuring the impact of safety problems that causes can be identified and targeted solutions can be developed. Organizations should use a proven, systematic approach to analyze specific breakdowns in maternal care and discover their underlying causes to develop targeted solutions that solve this complex problem. One of the advantages of employing process improvement tools such as Six Sigma DMAIC (Define, Measure, Analyze, Improve, and Control) is their systematic approach to solving complex problems. Specifically, these tools guide improvement teams to examine why processes fail to achieve their desired results. It is this systematic search for causes of quality and safety problems and the assessment of the relative contribution of each cause that help to focus on problem solving.

CONCLUSION

The current rate of US maternal deaths presents significant opportunities for improvement. Too often, health care organizations do not respond rapidly to abnormal vital signs and operate in a state of denial and delay. It is important to recognize potential risks to pregnant and new mothers, identify triggers, and establish protocols that guide immediate and effective responses to reduce mortality.
REFERENCES


