

Miscarriage, Premature Delivery, and Breast Cancer Risk

First-trimester miscarriage does not increase breast cancer risk.

Thirty-one percent of all conceptions will end in a miscarriage.⁵⁰ Over 90 percent of miscarriages take place in the first trimester.⁵¹

In her first trimester, the mother's ovarian production of estrogen and progesterone (in response to fetal hCG) maintains the pregnancy. If the mother's ovaries do not respond to the hCG, her hormone levels will be insufficient to maintain the pregnancy, and miscarriage will ensue. If the embryo suffers from an abnormality that does not allow sufficient hCG to be manufactured, or if the fetus suffers from an abnormality resulting in its death, miscarriage will ensue. After about 11 weeks' gestation, it is the fetus and placenta—not the mother—that produce most of the needed estrogen and progesterone to sustain the pregnancy.

Often, a mother who spontaneously aborts in the first trimester will remark that she never "felt" pregnant before she miscarried; for example, she may not have experienced any morning sickness or breast tenderness, as she may have in prior pregnancies. The levels of estrogen and progesterone during an abnormal pregnancy that result in a first-trimester miscarriage are insufficient to stimulate breast development. The mother's breasts are therefore unchanged and are not more vulnerable to breast cancer than they were before. In other words, following a first-trimester spontaneous abortion, the mother normally has no change in breast cancer risk,⁵² because her breasts were never stimulated to grow.

Much of the research on reproductive outcomes and breast cancer risk has failed to distinguish between first- and second-trimester miscarriage and has thus caused confusion in the literature—more anon.

Second-trimester miscarriage does increase breast cancer risk.

Second-trimester spontaneous abortions usually occur due to physical problems. For example, the umbilical cord may become twisted around the fetus's neck, leading to fetal death, or the placenta may tear. These second-trimester miscarriages occur among mothers whose estrogen and progesterone levels are normal and whose breasts therefore undergo those changes which increase the risk of breast cancer. Therefore, a mother who experiences a second-trimester miscarriage has an increased risk of breast cancer,⁵³ because her breasts have changed, and because the pregnancy will not continue to term, the natural maturation process that protects the breasts will not be completed.

Premature delivery before 32 weeks increases breast cancer risk.

Approximately 12.5 percent of all deliveries⁵⁴ are premature,⁵⁵ and approximately 3 percent of all premature deliveries take place before 32 weeks of pregnancy.⁵⁶ If a mother's pregnancy does not continue past 32 weeks due to premature delivery, she will not get the protective effect of pregnancy against breast cancer, because her breast tissue will not have developed enough Type 4 cancer-resistant lobules. In fact, her risk of breast cancer will be higher than that of a nulliparous (childless) woman, because her pregnancy has stimulated the development of more cancer-vulnerable Type 1 and Type 2 lobules and has thereby created more places for cancers to start (without the mitigating protective processes that are achieved with pregnancy lasting 32 weeks or more). Several studies have shown that premature delivery before 32 weeks more than doubles breast cancer risk.⁵⁷ Compared to a nulliparous woman or a woman who has experienced pregnancy past 32 weeks' gestation, there are more sites in a woman's breast for cancers to develop following a premature delivery or second-trimester miscarriage before 32 weeks, at which point, sufficient numbers of Type 1 and Type 2 lobules have matured into Type 4 lobules.

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⁵⁴ Institute of Medicine, Committee on Understanding Premature Birth and Assuring Healthy Outcomes, *Preterm Birth: Causes, Consequences and Prevention*, eds. Richard E. Behrman and Adrienne Stith Butler (2007), 1; http://books.nap.edu/openbook.php?record_id=11622&page=1 (accessed January 16, 2013).

⁵⁵ A premature delivery is one taking place before 37 weeks' gestation.

⁵⁶ Institute of Medicine, Committee on Understanding Premature Birth and Assuring Healthy Outcomes, *Preterm Birth: Causes, Consequences and Prevention*, eds. Richard E. Behrman and Adrienne Stith Butler (2007), 75; http://books.nap.edu/openbook.php?record_id=11622&page=75 (accessed January 16, 2013).

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