

## Changes During Pregnancy and Breastfeeding

### ***Embryo stimulation of hormone production***

The embryo has a direct role in stimulating the mother's own protective biological processes. A mother's breasts enlarge very soon after conception, becoming sore and tender, one of the first signs of pregnancy. This occurs because the embryo's production of hCG (human chorionic gonadotropin) acts as a chemical signal and causes the mother's ovaries to increase her production of estrogen and progesterone before the embryo is even implanted in the mother's womb. (During the first half of pregnancy, estrogen levels rise rapidly: 2,000 percent during the first trimester.) These hormones sustain the pregnancy. Again, the maturation process that protects a woman from breast cancer happens only because the fetal placental unit produces the hormones hCG and hPL (human placental lactogen), which prepare the mother to breastfeed. HCG also protects the mother from forming breast cancer by stimulating the mother's production of alpha inhibin, which is a tumor suppressor protein.<sup>39</sup> Research shows hCG can inhibit breast cancers from forming.<sup>40</sup>

### ***Benefits of early and repeated pregnancies***

A woman who has her first full-term pregnancy at age 20 has a 90 percent lower risk of breast cancer than a woman who remains childless or waits until she is 30 for her first full-term pregnancy.<sup>41</sup> Each year a woman delays pregnancy after age 20, her risk of premenopausal breast cancer increases 5 percent and her risk of postmenopausal breast cancer increases 3 percent.<sup>42</sup> This results from the lengthening of the "susceptibility window," the period between menarche and a first full-term pregnancy, when the breast is most susceptible to carcinogenesis. It is the time when the breast is composed solely of cancer-vulnerable Type 1 and Type 2 lobules. However, if a woman delays her first pregnancy until after age 30, she will have a transiently (but statistically significantly) increased risk of breast cancer for 10 to 15 years before she gains the risk-lowering benefit of pregnancy.<sup>43</sup>

Furthermore, a woman's breast cancer risk increases 0.7 percent for each year subsequent births are delayed after the first time she gives birth.<sup>44</sup> However, as stated earlier, with each pregnancy after her first, a mother reduces her risk of breast cancer by 10 percent.<sup>45</sup>

### ***Benefit of full-term pregnancy before an induced abortion***

Full-term pregnancy is protective against breast cancer; hence, it would seem that a woman who procures an induced abortion only after she has given birth is at a lower risk of breast cancer than a woman who has an induced abortion before giving birth.<sup>46</sup>

China's one-child policy means that many women obtain abortions after the birth of their first child. Chinese women (as is the case for all women) who have their first abortion after they have already had a full-term pregnancy have a lower risk of breast cancer than those who have not already had a full-term pregnancy when they obtain an abortion.<sup>47</sup>

***Benefit of breastfeeding***

Many studies have shown<sup>48</sup> that breast cancer risk is reduced in proportion to the length of time a mother breastfeeds, should she choose to do so. Women who breastfeed such that all of their infant's calories come from their breast milk will also cease their regular menstrual cycles for up to two years. The fewer menstrual cycles a woman has in her lifetime, the lower is her risk of breast cancer. Many of the cycles a woman initially regains while breastfeeding are anovulatory (that is, an egg is not produced). These anovulatory cycles are lower in estrogen and therefore do not increase the mother's risk of breast cancer as much as normal ovulatory cycles do.

Daling et al. found no detectable increased risk for women who first lactate fewer than ten years after an induced abortion, relative to women with no induced abortion history. By contrast, a woman who lactates for the first time over 10 years after an induced abortion has a significantly increased risk of breast cancer.<sup>49</sup>

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<sup>41</sup> Mats Lambe, "Chapter Six: Reproductive Factors," in *Breast Cancer Epidemiology*, ed. Christopher I. Li (New York: Springer, 2009), 129-136.

<sup>42</sup> Françoise Clavel-Chapelon and Mariette Gerber, "Reproductive Factors and Breast Cancer Risk," *Breast Cancer Research and Treatment* 72, no. 2 (2002): 107-115.

<sup>43</sup> Note that women who delay first birth until age 25 or later have, relative to nulliparous women, a marginally statistically significantly increased risk of diagnosis at age 30. See Mats Lambe, Chung-cheng Hsieh, Dimitrios Trichopoulos, Anders Ekblom, Maria Pavia, and Hans-Olov Adami, "Transient increase in the risk of breast cancer after giving birth," *New England Journal of Medicine* 331 (1994): 5-9.

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