

## Full-term Pregnancy and Breast Cancer Protection

If a pregnancy is healthy and lasts past 32 weeks, even should a mother deliver prematurely, she will have partial protection against breast cancer. Pregnancy lasting 32 weeks is protective against breast cancer, as noted earlier, and between 32 and 40 weeks' gestation, she will gain an additional 11 percent reduction in breast cancer risk.<sup>61</sup> If a mother delivers at 40 weeks, which is "full term," about 70 to 90 percent of her mammary glands will be composed of fully mature Type 4 lobules.<sup>62</sup> (Though Type 4 lobules are completely mature, not all the breast tissue matures: 10 to 30 percent remain Type 1 and Type 2 lobules and thus remain cancer-susceptible.) This is why a full-term pregnancy is a known and significant protection against breast cancer. Furthermore, as stated earlier, each pregnancy after her first reduces a mother's risk of breast cancer by an additional 10 percent.<sup>63</sup>

Despite the protective effect of a full-term pregnancy, with the maturation of breast tissue from predominantly cancer-vulnerable Type 1 and Type 2 lobules into cancer-resistant Type 3 lobules, it is known that some parous women will still get breast cancer. Type 3 lobules are the predominant lobule in premenopausal parous women; but interestingly, when in one study the breast tissue of parous women who got breast cancer was examined and compared to parous women who did not get breast cancer, Type 1 rather than Type 3 lobules were predominant.<sup>64</sup> Ductal cancers occur in Type 1 lobules. Also to be noted is that these women either had a late first full-term pregnancy or a family history of breast cancer. The maturation capability of these Type 1-dominant parous women who develop breast cancer may be deficient.<sup>65</sup> These findings are consistent with other studies that show the importance for cancer resistance of breast development through full-term pregnancy.

As stated earlier, it is only after 32 weeks' gestation that the elevated levels of hPL, in concert with other pregnancy hormones, allow the full maturation of cancer-resistant breast tissue to occur. Therefore, whether a pregnancy ends before 32 weeks with a premature birth, a second-trimester miscarriage,<sup>66</sup> or an induced abortion, a woman's risk of breast cancer is increased. In all three events, the woman's breasts have been exposed to the same pregnancy hormones (estrogen, progesterone, and hCG). Elevated levels of estrogen and progesterone cause more cancer-vulnerable breast tissue to form, and this tissue's natural maturation process is arrested. By contrast, full-term pregnancy and lactation bring most of the lobules in the breast to full maturity and provide protection against breast cancer.

### REFERENCES

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<sup>62</sup> J. Russo, Y.-F. Hu, X. Yang, and I. Russo, Chapter 1: "Developmental, Cellular, and Molecular Basis of Human Breast Cancer," *Journal of the National Cancer Institute Monographs* 27 (2000): 22. See also Jose Russo and Irma H. Russo, "Development of the Human Mammary Gland," in *The Mammary Gland*, eds. M. Neville and C. Daniel (New York: Plenum Publishing Corporation, 1987).

<sup>63</sup> Mats Lambe, Chung-cheng Hsieh, Hsiao-wei Chan, Anders Ekblom, Dimitrios Trichopoulos, and Hans-Olov Adami, "Parity, Age at First and Last Birth, and Risk of Breast Cancer: A Population-Based Study in Sweden," *Breast Cancer Research and Treatment* 38 (1996): 305-311.

<sup>64</sup> J. Russo, A.L. Romero, and I.H. Russo, "Architectural pattern of the normal and cancerous breast under the influence of parity," *Cancer Epidemiology, Biomarkers and Prevention* 3 (1994): 219.

<sup>65</sup> R.B. Dickson, J. Russo Chapter 2: "Biochemical Control of Breast Development," in *Diseases of the Breast*, eds. Jay R. Harris, Marc E. Lippman, Monica Morrow, and C. Kent Osborne, 2nd ed. (Philadelphia: Lippincott Williams & Wilkins, 2000).

<sup>66</sup> During which women generally have normal hormonal levels. See Section II, D for further explanation.

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