Epidemiological evidence suggesting that prolonged breastfeeding protects against breast cancer continues to accumulate (Chang-Claude 2000, Zheng 2000, Kim 2007, Shema 2007). Studies show a decreasing risk of breast cancer with increased number of months of breastfeeding. Additionally, preliminary data suggest that there are protective effects conferred by breastfeeding for mothers who are survivors of childhood cancers (Ogg 2011). The benefits consisted of reduced risk of metabolic syndrome, cardiovascular disease, and reduced risks of secondary tumors. Therefore, public health workers should continue to emphasize the risks of not breastfeeding for the mother, as well as the baby.

The top risk factors for breast cancer are a woman’s age and having a first-degree relative with a history of breast cancer. Breastfeeding is thought to reduce the risk of breast cancer through 2 primary mechanisms: the reduction in lifetime ovulatory episodes, and differentiation of breast tissue. Full lactation delays a resumption of menstruation, sometimes for many months. Lactation amenorrhea is thus thought to be protective. Alpha-lactalbumin is a human milk component. Tumor cell death can be induced by HAMLET (a milk complex of oleic acid and alpha-lactalbumin). Healthy cells are not affected by the activity of HAMLET. It may be that this milk complex provides a defense for the tissues of the breast against the development of breast cancer (Franca-Botelho 2012).

Perhaps lactation also has a flushing effect on debris that accumulates in the breast ducts (Helewa 2002). The commonly yellow color of colostrum derives from the presence of carotenoid fat globules. Djuric (2005) studied nipple aspirate fluid taken from women who had never lactated and women who lactated only for short periods, compared to nipple fluid aspirated from women who lactated 6 months or more. Carotenoids and tocopherols are thought to be protective against breast cancer. Carotenoids may dilute and help expel substances stored in the non-lactating gland such as DDT, PCB, and other environmental contaminants (Patton 1990).

At one point, it was thought that a woman’s intake of dietary fat might increase her risk of developing breast cancer, and that increasing dietary fiber might reduce it. Studies do not support this theory (Rohan 1988, Willett 1992). However, exposure to breast milk in early childhood may decrease the risk of developing breast cancer later in life.

Freudenheim (1994) observed that having been breastfed is associated with a decrease in breast cancer. Martin (2005) performed a meta-analysis on a large cohort of cancer patients and identified a significantly reduced risk of premenopausal breast cancer in women who had been breastfed as infants.

A number of countries have noted increasing rates of breast cancer in their populations as rates of breastfeeding incidence and duration have fallen (Shema 2007, Kim 2007). Because having been breastfed as a child and breastfeeding each appear to be independently protective, the choice to breastfeed may be one of the few proactive measures that can be undertaken to lower a woman’s lifetime risk of developing breast cancer. In fact, the evidence for a protective effect of breastfeeding is now sufficiently well-established to motivate changes in cancer prevention policy recommendations.

In 2002, the Collaborative Group on Hormonal Factors in Breast Cancer concluded that, “The longer women breastfeed the more they are protected against breast cancer. The lack of or the short lifetime duration of breastfeeding typical of women in developed countries makes a major contribution to the high incidence of breast cancer in these countries.” Such statements have resulted in specific recommendations to women urging exclusive breastfeeding for 6 months, and the continuation of breastfeeding after the introduction of solids as a cancer prevention strategy (WCRF 2007).

The protective effect of breastfeeding does not alter the fact that it is still possible for an individual woman to develop breast cancer during pregnancy or lactation. Individuals who have been breastfed may still develop breast cancer. There is evidence that there is a transient increase in risk of breast cancer in the first 3 to 4 years after delivery of a singleton child (Helawa 2002). Following this transient period of increased risk, lifetime risk is lower than that of women who have never given birth.

Because breast cancer risk increases during pregnancy and remains elevated for some period of years afterward, cancer-associated proteins that are secreted into breast milk may provide a way to detect cancer in the lactating breast and to assess a woman’s risk for future breast cancer (Arcaro 2012).

The incidence of breast cancer in young women has risen, and because many women now delay child-bearing, pregnancy following treatment for breast cancer is more
common (Dow 1994). Owing to these demographic factors, the LC must be aware of the symptoms that require evaluation to rule out breast cancer.

Breast Cancer During Pregnancy and Lactation

Breast cancer is the second leading cause of cancer deaths among American women. The National Cancer Institute (at the National Institutes of Health) reports that 12.4 percent of women born in the US will develop breast cancer at some point in their lives (Howlander 2012). Of these, 25 percent develop tumors in their child-bearing years (Camune 2007). The incidence of breast cancers occurring in pregnant or lactating women is felt to be 2 to 3 per 1,000 (Steyskall 1996).

Unfortunately, diagnosis and treatment are often delayed in pregnant and lactating women. The reasons for this are complex and include lack of awareness, health care provider distraction, and psychological denial. According to researchers at M.D. Anderson Cancer Center in Houston, Texas, most women who visit a family physician with typical symptoms of inflammatory breast cancer (IBC) are diagnosed and treated for lactational mastitis (Kelly 2013).

While describing initial treatment for mastitis as reasonable, the IBC researchers remark that it is unreasonable to order a second or third round of antibiotics if the first round fails to produce improvement. Mammography and ultrasonography should be employed to determine if there is a mass that can be biopsied. While overdiagnosis is not desirable, the prognosis for survival with IBC is poor if treatment is delayed. As with other types of cancer, early identification provides the best chance of survival.

Prenatal care should include serial breast examinations, and women should continue monthly breast self-examinations during lactation. It is normal for lactating breasts to feel lumpy, and plugged ducts and mastitis are not unusual events. However, a discrete lump that is different from surrounding breast tissue may be a sign of breast cancer (Lind 2004). Breast exams increase the woman’s familiarity with changes in her own breasts, alert her to masses that do not resolve with standard treatment, or that recur persistently in the same area of the breast. A physician should evaluate such masses.

Health care providers may be distracted by conditions such as pregnancy and lactation, dismissing or ignoring symptoms that would, in a non-lactating woman, trigger prompt evaluation. Misdiagnosis of carcinoma of the breast is the most frequent cause of malpractice litigation in the United States. The willingness to seek a second opinion has saved many lives.

Private practice lactation consultants may encounter situations where a woman presents with suspicious findings (Petok 1995). LCs must know the warning signs for breast cancer and refer women for prompt medical evaluation.

Red Flags and Warning Signs for Breast Cancer

The following warning signs require prompt referral to the woman’s primary care provider:

- Skin color changes on the breast, red breast in the absence of fever (Dahlbeck 1995, Cristofanilli (2003)
- Skin texture changes, peau d’orange appearance, Figs. 253 and 254, edema, indurations, Fig. 289.
- Exaggerated hair follicle pits (Fig. 253) (Kelly 2013)
- Masses, especially fixed, irregular shaped lumps
- Copious, spontaneous, clear or bloody nipple discharge (typically unilateral)
- Mastitis that occurs repeatedly in the same area and does not resolve with conservative treatment (i.e., appropriate drugs and management)

Diagnostic Tests and Lactation

It is possible to perform diagnostic tests on pregnant and lactating women without weaning, although mammograms are more difficult to interpret, owing to the density of the pregnant and lactating breast. Ductal lavage is a technique to achieve non-invasive access to breast tissue. It involves duct cannulation and endoscopy. The duct is washed, and the flushed tissue is examined for breast cancer and precancerous changes (Love 1996). However, whether the ductal lavage technique is diagnostically useful during lactation is unknown.

Ultrasound (Fig 281) is a safe diagnostic technique that can be used during pregnancy and lactation. It is painless and useful in distinguishing between cystic (fluid-filled) and solid masses (Freund 2000, Lind 2004).

Galactoceles are a type of cyst that can form in the breast during lactation. The material aspirated from such a cyst is milk. Abscesses are another type of cystic lesion, and the aspirate will include purulent material (pus). Needle biopsy can be performed to examine cells aspirated from masses that have been identified by ultrasound. Ch. 11 contains a full discussion of types of abscesses.

Tumors are solid (rather than cystic) masses. Many types of tumors (such as fibrocysts) are benign. A breast biopsy
is the most definitive type of diagnostic measure used to identify the nature of a mass and to rule out cancer. Because it is a surgical procedure, it is also the most invasive diagnostic tool. While it is often necessary, biopsy poses a certain degree of risk to current or future lactation owing to incision and removal of tissue (Osuch 1998). Such risk, however, must be evaluated in terms of its potential for saving the mother’s life.

**Inflammatory Breast Cancer**

Inflammatory breast cancer (IBC) is a particularly aggressive form of cancer with a high mortality rate. Although one of the rarer forms of breast cancer, it accounts for 1 to 5 percent of all breast cancer cases, but 10 percent of the breast cancer deaths (National Cancer Institute 2013). Early diagnosis is critical. However, diagnosis of inflammatory breast cancer may be delayed because it shares important symptoms with mastitis.

While a woman with inflammatory breast cancer typically experiences no fever, the breast becomes warm, red, heavy and edematous, often presenting with peau d’orange changes and exaggerated hair follicle pits. The area of redness is generally large, often covering the whole breast. The nipple appears flattened and indurated (retracted). The nipple may ooze fluid and nipple skin may become crusted (Dahlbeck 1995). Inflammatory breast cancer can be difficult to detect with mammography. Examination of malignant cells accessed by fine needle or excision biopsy confirms the diagnosis. Skin biopsy is indicated if there is no mass.

African American women have a higher incidence of inflammatory breast cancer (Cristofanilli 2003).

**Breastfeeding after Treatment for Breast Cancer**

Breastfeeding is discontinued during chemotherapy for breast cancer because the drugs used are toxic and may harm a breastfeeding baby.

Some women become infertile as the result of chemotherapy, which can cause chemical menopause. Other women succeed in becoming pregnant after cancer treatment and they can be encouraged to breastfeed. No survival disadvantage has been identified by subsequent pregnancy or lactation (Dow 1994, Kasum 2006, Camune 2007). There is no contraindication for breastfeeding after treatment for breast cancer (Danforth 1991). Lactation usually proceeds normally in the unaffected breast. In the treated breast, functional lactation is possible, but generally milk production is significantly diminished in the majority of patients (Moran 2005).

Breast conserving procedures such as lumpectomy rather than mastectomy are possible in many cases. However, radiation therapy and the damage to the structures of the breast caused by invasive surgery may render the breast incapable of lactation. Leaf (2013) describes lactation following radiotherapy in at least 50 percent of patients but in reduced volume. Partial lactation has occurred in some cases, resulting in some ability to lactate on the treated breast (Higgins 1994).

David (1985) reports a case of a 36 year-old woman who had a “poorly differentiated infiltrating ductal carcinoma in the right tail of Spence area.” The mass was excised and her nodes were unaffected. She received radiation therapy, and became pregnant a year later. Her treated breast did not enlarge as much as the untreated left breast during the pregnancy, but following the birth the treated breast did lactate. The milk was slightly thicker, and the breast produced about half the amount of milk that the left breast produced. Leaf (2013) reports biochemical changes in irradiated breast milk.

BWC worked with a woman who breastfed unilaterally following treatment for breast cancer with lumpectomy. The lumpectomized breast became engorged following the birth of the baby. The mother observed spontaneous leaking. Because the woman elected not to stimulate that breast, it soon involuted. She breastfed her child uneventfully on the unaffected breast.

**Lumpectomy**

The 48 year-old woman shown in Fig. 282 has a radial incision over the location of a lumpectomy. She had breastfed her children. A history of having breastfed does not justify complacency regarding the development of lumps in the breast, and the woman consulted with a surgeon who performed the lumpectomy. Interestingly, a faint scar from an earlier biopsy is visible, running exactly parallel to the lumpectomy scar, at the areolar edge. This earlier biopsy revealed a benign tumor. For a younger woman, with more childbearing years ahead of her, a radial rather than a circumferential incision might lessen the impact of such invasive surgery.

The same woman is pictured in Fig. 283 during radiation therapy. Note the bronzed appearance of the skin. Approximately 90 percent of patients treated with radiation therapy will develop some degree of radiation-induced dermatitis (Harper 2004) that can produce significant discomfort and limit daily activity. Previously, soap and water washing of irradiated skin was discouraged due to concern that a drying effect of soap would exacerbate radiation dermatitis. When systematically evaluated, how-
ever, moist desquamation (shedding of skin) developed in 33 percent of those who did not wash the skin as compared with 14 percent of those who washed with soap and water. Roy (2001) hypothesized that washing may reduce moist desquamation by removing skin microbes that act as inflammatory stimuli at the basal layer of the skin. The study concluded that washing the skin does not increase skin toxicity.

Fig. 284 shows the scar from an axillary biopsy taken to see whether cancer has spread to the lymph nodes. The presence or absence of spread to the nodes defines the stage of the cancer. Staging is a way to conceptualize each case of breast cancer so that appropriate treatment can be selected. Stage 1 describes a tumor with no affected lymph nodes. Stage 2 is a small tumor with positive lymph nodes, or a larger tumor with positive or negative nodes, or a large tumor with negative nodes. Stage 3 is a large tumor with positive lymph nodes, or a tumor with “grave signs.” Stage 4 is a tumor that has obvious metastasis (Love 2000).

The woman in Fig. 285 was treated 8 years prior for breast cancer with lumpectomy, radiation therapy, and chemotherapy. Her left breast did not experience any changes during pregnancy or postpartum. She planned to breastfeed using her right breast. Note the size difference in her breasts from the increase in breast development during pregnancy.

**Breastfeeding after Mastectomy**

A 32-year-old woman is pictured in Fig. 286. She had 3 children at the time that she was diagnosed with breast cancer. Her affected breast was removed, and she was told that she would experience chemical menopause. She and her family were shocked when she became pregnant 4 years later. She described herself to the LC as having been “traumatized by my medical treatment.” She had a home birth supported by a midwife, and 2 weeks later, requested to see the LC because of a cracked nipple on her remaining breast. Her baby was gaining well, and judging from the orientation of the wound, the main issue appeared to be a routine positioning and latch problem.

The mother was instructed to gently cleanse the wound in order to prevent nipple infection and mastitis and to pump the breast to give the nipple a chance to heal. The midwife prescribed topical mupirocin ointment to prevent infection. The baby was breast-fed pumped milk for 5 days until the wound healed. An experienced breastfeeding mother who was determined to succeed, this woman was not worried about subsequent breast refusal. As expected, the baby easily transitioned back to breastfeeding.

The 28-year-old woman in Fig. 287 is shown breastfeeding her 18-day-old third child following mastectomy for breast cancer. The woman’s husband had discovered a lump in her left breast the previous summer. The mother was breastfeeding their 2-year-old son at the time. Because the mother was deaf, the father phoned BWC to describe the persistent mass in the breast. BWC recommended medical evaluation. A breast surgeon performed a needle biopsy and detected cancerous cells in the aspirate. The surgeon recommended immediate weaning and mastectomy to remove the breast and axillary lymph nodes.

BWC assisted with an emergency weaning and took photos of the process. In Fig. 288 faint bruising appears over the location of the biopsy at 8 o’clock on the left breast. On Day 3 of the weaning (Fig. 289), engorgement has lessened to the extent that it is possible to perceive an induration on the underside of the breast where the tumor is located.

Chemotherapy and radiation treatment followed the mastectomy. During radiation treatment, the woman became pregnant, and her healthy daughter was born at term. Breastfeeding continued uneventfully for 5 months, during which time the baby grew normally, feeding only from one breast. Gradual weaning was begun at this point to allow the mother’s physicians to perform diagnostic tests in response to elevated tumor markers in her blood. Sadly, 5 years after these photos were taken, the young mother died of breast cancer.

**Biopsy to Rule Out Paget’s Disease of the Nipple**

The 32-year-old mother whose nipple is pictured in Figs. 290-292 nursed her first child uneventfully for 15 months. After the birth of her second child, she developed an eruption on her left nipple that continued essentially unabated for 5 months. The LC observed an oozing, crusty left nipple on Day 7 postpartum. The right nipple was also cracked and irritated.

The LC adjusted the mother’s positioning, and antibiotics were begun within 24 hours because the mother had developed febrile symptoms. After a week on antibiotics, the mother developed the symptoms of what she suspected was a yeast infection. At 6 weeks postpartum, after constant medical treatment, the nipples appeared to be healing. However, because the nipples were still slightly inflamed, the mother consulted the first of 4 dermatologists. The first dermatologist advised the mother to apply a hydrogel dressing after each feeding, which immediately worsened her symptoms, especially on the left nipple.

Over the next months, the mother consulted 3 other dermatologists and continued contact with her obstetrician.
and her LC. The mother was treated for yeast infection, staph infection, and contact irritant dermatitis. She was prescribed Diflucan, Loprox, Ketoconazole, Zithromax, Locoid ointment, Elocon cream and Vaseline. Cultures from her milk and the baby’s mouth and nose all showed normal flora. For a period of 3 months, the mother exclusively pumped, feeding the baby by bottle. While her nipples improved during the time she pumped, they never healed completely and worsened as soon as she resumed any breastfeeding.

At 6 months, the left nipple again appeared erythematous and edematous. A fourth dermatologist advised a punch biopsy to rule out Paget’s disease (a type of cancer of the nipple that resembles eczema and is also referred to as erosive adenomatosis.) In Fig. 290, the dermatologist injects Lidocaine into the nipple to numb it. A numbing cream was applied previously to the nipple to reduce the sting of the injection.

In Fig. 291 a small punch tool is used to remove a core of tissue (seen being removed in Fig. 292) that was sent to a lab for analysis. The sample indicated that there was no evidence of disease. In fact, there was no conclusive evidence even of a contact or irritant dermatitis. In short, nothing was discovered to explain this woman’s chronic nipple irritation.

The dermatologist sutured the wound made by the biopsy. BWC expressed concern about the stitches, fearing they would interfere with breastfeeding. The mother phoned BWC several hours later to report that clots of blood had appeared in her pumped milk. Her breast was not draining well and felt engorged. In contrast to pumping, the baby was able to soften the breast, but the knot in the stiff sutures dug a deeper hole in her nipple each time the baby nursed. Additionally, her bra was rubbing on the sutures and this irritated the wound. The mother called the doctor who instructed her to remove the sutures. The doctor advised her to keep packing the hole in her nipple with mupirocin. However, within 24 hours, the mother’s breast was bright red. She was diagnosed with mastitis and was treated with oral antibiotics. Once she began the oral antibiotics, healing proceeded uneventfully.

Several studies have discussed the development of atopic dermatitis, a chronic inflammatory skin disease, where colonization of skin with Staphylococcus aureus is known to produce toxins with superantigen activity. Perhaps sensitization occurred early in the course of this mother’s situation. At the time of the biopsy, her results showed only a dilated vasculature, a very non-specific finding; however, the LC was uncertain whether tests for superantigen activity were performed.

Although the mother in this case stated that she had no food allergies, she consumed large amounts of dairy products, which she felt constituted the mainstay of her diet. BWC had advised a dairy elimination very early in the case, but the mother only abstained from dairy for about a week. During the biopsy, the LC and dermatologist discussed the possibility of a relationship between diet and the woman’s sore nipples. After this discussion, the mother removed dairy products for several weeks and felt that it did make some difference. As time went on, the baby exhibited signs of atopic disease. He developed eczema and constipation around 6 months, and his mother had to remove dairy from his diet entirely by the time he reached toddlerhood.

Reaction from exposure to dairy protein in the mother’s diet could have provoked salivary changes irritating to the nipple. It was interesting, however, that the nipple condition never totally resolved, even when the baby was not breastfeeding directly for long periods of time. The woman continued to breastfeed past the baby’s second birthday. Her nipples, however, remained vulnerable, and breastfeeding was never comfortable for her. BWC stayed in contact with this woman, and 10 years later the woman reported no breast or nipple complications from her experience.

BWC is generally reluctant to advise dairy restriction; however, she observed another client whose sore nipples cleared up (after all other suggestions failed to bring results) when dairy protein was taken out of the woman’s diet. Dairy elimination was trialed on the premise that a sensitive baby might experience salivary changes in reaction to exposure of the offending protein through the milk, and that these changes might irritate the nipple. A 3 week dairy elimination resulted in healed nipples. At the time, the supervising physician felt the improvement was merely coincidental; however, the mother was so relieved to have no more nipple pain that she remained on the dairy-free diet.

It became clear that her baby was allergic to dairy protein when, at age 5 months, the father gave the baby a taste of ice cream from a spoon. A drop of ice cream also spilled on the baby’s cheek. The cheek was scalded where the ice cream touched it. Within an hour, the baby was taken to the emergency room with symptoms of anaphylactic shock. A similar event was described in an article about severely allergic children featured in the New York Times (Thernstrom 2013).

Extreme reactivity to minute quantities of allergen by skin contact is not unique. Another 5 cases are reported in the literature. One involved a 3 month-old male...
who later proved to have multiple food allergies. He developed localized skin irritation when his mother kissed him after eating cereal with milk (Tan 2001). In all 5 cases, reactions occurred while the children were being breastfed (exclusively in 4 and mixed feeding in one). A connection between food allergy and sore nipples deserves more investigation, and while it is important to rule out breast cancer (especially Paget’s disease of the nipple), there may be alternate etiologies involved when nipples fail to heal.

Complex cases remind LCs that multiple causes exist for breast lumps and skin conditions of the nipples. Rarely are they cancer, but the LC has an ethical responsibility to not overlook suspicious symptoms that require further investigation by a qualified physician.


