Returning to Work While Breastfeeding

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Mothers who work outside the home initiate breastfeeding at the same rate as mothers who stay at home. However, the breastfeeding continuance rate declines sharply in mothers who return to work. While the work environment may be less than ideal for the breastfeeding mother, obstacles can be overcome. Available breast pump types include manual pumps, battery-powered pumps, electric diaphragm pumps, electric piston pumps, and hospital-grade electric piston pumps. Electric piston pumps may be the most suitable type for mothers who work outside the home for more than 20 hours per week; however, when a mother is highly motivated, any pump type can be successful in any situation. Conservative estimates suggest that breast milk can be stored at room temperature for eight hours, refrigerated for up to eight days, and frozen for many months. A breastfeeding plan can help the working mother anticipate logistic problems and devise a practical pumping schedule. A mother's milk production usually is well established by the time her infant is four weeks old; it is best to delay a return to work until at least that time, and longer if possible. (Am Fam Physician 2003;68:2201-8,2215-7. Copyright© 2003 American Academy of Family Physicians.)

A patient information handout on returning to work while breastfeeding, written by the author of this article, is provided on page 2215.

Exclusive breastfeeding for the first six months of life is recommended for most infants, followed by breast milk supplemented with solid foods for at least the rest of the first year.[1,2] [References 1 and 2—Evidence level C, consensus/expert guidelines] Although breastfeeding rates in the United States have improved, they remain below the Healthy People 2010 goals *(Table 1)*.[3,4] As of January 2003, 60.7 percent of women are working outside the home, and women comprise 46.5 percent of the civilian work force.[5] While working outside the home does not affect the initiation rate for breastfeeding, it does affect the duration of breastfeeding[3,6] *(Table 2)*.[3]

To achieve the Healthy People 2010 goals, family physicians and other health care professionals should provide encouragement, advice, resources, and support to help mothers continue breastfeeding after they return to work. During an early prenatal appointment, the physician should ask the pregnant woman whether she intends to work outside the home after the birth of her infant. Another time to discuss work plans is at the two-week or one-month well-child check-up. If a mother intends to return to the work force, the family must begin making plans. Hence, education about community support, breast milk pumps, breast milk storage, and breastfeeding planning should be given as early as possible.

See page 2113 for definitions of strength-of-evidence levels.

See editorial on page 2129.

Legislative and Community Support

U.S. legislation supports breastfeeding in selected situations. The Family and Medical Leave Act[7] provides 12 weeks of unpaid time for workers to care for their newborns. Women who take longer maternity leaves have a better breastfeeding continuance rate,[8] but extended leave time is not an option for many families.

Several federal initiatives[9,10] have directly addressed breastfeeding in the workplace. Corporate lactation support programs clearly can be effective in improving breastfeeding duration. As reported in one review,[11] 75 percent of women who participated in two corporate lactation support programs breastfed for at least six months. Indeed, the best long-term approach to improving the breastfeeding continuance rate may be to help communities establish lactation support programs for local businesses. Until such programs are in place,

Manual-cycle pumps require the mother to release the suction at appropriate intervals to allow adequate tissue perfusion between suction cycles.

TABLE 1
Breastfeeding Rates in the United States

	Percentage of infants who are breastfed		
Source	*Early postpartum period*	*Six months of age*	*One year of age*
Mothers survey: breastfeeding trends through 2000[3]	68	31	17
Healthy People 2010 goals[4]	75	50	25

Information from references 3 and 4.

TABLE 2
Effect of Employment on Breastfeeding Rates

	Percentage of infants who are breastfed		
Maternal employment status	*Early postpartum period*	*Six months of age*	*One year of age*
Employed outside of the home	67.7	Full time: 22.8 Part time: 33.4	Full time: 10.6 Part time: 19.2
Not employed outside of the home	68.0	35.4	22.0

Information from reference 3.

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family physicians and other health care professionals should supply information about other support resources.

Evidence shows that the breastfeeding rate improves when parents are given the names of breastfeeding resources and groups.[12,13] [Reference 12—Evidence level B, meta-analysis of lower quality randomized trials; Reference 13—Evidence level B, uncontrolled clinical trial] Some parents prefer to receive a list of Web sites, such as the list presented in *Table 3* or the list provided in the patient information handout that accompanies this article. In addition, numerous books on breastfeeding are available.

It is essential that physicians be aware of groups that provide peer support to breastfeeding mothers. Regional La Leche League groups, for example, can be located by telephone (800-525-3243; United States only) or through the organization's Web site (http://www.lalecheleague.org).

A resource list can be helpful to the breastfeeding mother and her family. A number of comprehensive lists have been published.[2,11,14] For example, an appendix to the position paper on breastfeeding from the American Academy of Family Physicians[2] contains excellent lists of physician resources, patient information sources, and breastfeeding support organizations.

Breastfeeding mothers also should know where to find information about legislation affecting breastfeeding in their area. Information on legislation is available through the La Leche League Web site.

Breast Pumps

The infant empties the breast by a mechanism of peristaltic tongue massage combined with suction pressure and frequency. Most breast pumps are designed to empty a breast of its milk by simulating the suction pressure and frequency of an infant's suckling; newer models are being designed to incorporate the massaging function as well.[15] Pumping or hand expression is recommended every three

to four hours during the time that mother and infant are separated.

An infant feeds with a suction pressure of 50 to 220 mm Hg.[16] Suction pressure affects the mother's comfort, the efficiency of milk expression, and the production of milk. Pumps with suction pressures higher than 220 mm Hg may cause nipple discomfort. Maximal pressures of less than 150 mm Hg may be inadequate to empty the breast.[15] Autocycling pumps provide an automatic release of the suction pressure, thereby allowing adequate tissue perfusion between suction cycles. Manual-cycle pumps require the mother to release the suction at appropriate intervals. The mother must follow manual-cycle pump instructions carefully to avoid applying excessive suction or suction for an excessive time, which can lead to nipple pain and even ischemia.[15]

An infant has a suction frequency of 40 to 126 sucks per minute (mean: 74 sucks per minute).[15] Pump simulation of these suction frequency values provides the best results, because prolactin levels increase when the frequency is physiologic. When prolactin levels are high, the breast creates more milk and, thus, maintains the milk supply. Prolactin levels also increase when both breasts are emptied simultaneously (double pumping).[8] If a single pump is used, the pump should be switched from one breast to the other breast every five minutes; this approach is more effective than fully emptying one breast and then emptying the other breast.[11] Once a mother is experienced, double pumping can take as little as 10 minutes; single pumping may take 15 to 20 minutes.

Types of breast pumps include manual pumps, battery-powered pumps, electric diaphragm pumps, electric piston pumps, and hospital-grade electric piston pumps *(Table 4)*. There are many pump manufacturers, and hospital-grade pumps can be rented through most medical centers.

The type of pump that is best depends on the age of the infant (i.e., how much milk needs to be provided), how long and how fre-

TABLE 3
Web Sites for Information on Breastfeeding

La Leche League International: http://www.lalecheleague.org
Information on a multitude of breastfeeding-related topics; help in finding local support groups; breastfeeding advocacy
American Academy of Family Physicians: http://www.aafp.org
Breastfeeding position paper
Pumping Moms Information Exchange: http://www.pumpingmoms.org
List serve for mothers who use breast pumps; answers to frequently asked questions about breast pumps, pumping technique, milk supply, and milk storage; breastfeeding advocacy
Promotion of Mothers Milk, Inc.: http://www.promom.org
Breastfeeding information; discussion forums; breastfeeding advocacy
National Woman's Health Information Center: http://www.4women.gov/breastfeeding
Information on making breastfeeding easier at home and work; rights and legislation; advice line: 800-994-9662 (in United States only)
WIC Works Resource System: http://www.nal.usda.gov/wicworks
Breastfeeding promotion and support topics; educational materials; breastfeeding journal articles, studies, and reports

WIC = Women, Infants, and Children.

TABLE 4
Types of Breast Pumps

Type of pump	*Description*	*Advantages*	*Disadvantages*	*Cost ranges**
Manual pump	Hand powered	Small, portable, quiet, inexpensive	Labor intensive Single pumping only Difficult to achieve adequate suck frequency or suction pressure	$ 15 to 50
Battery-powered pump	Usually a hand pump that comes with a battery option; also, mini-electric pump	Small, portable, relatively quiet, inexpensive Double pumping using two separate pumps	May go through batteries quickly May provide inadequate suction pressure With some models, only manual cycling	75 to 100
Electric diaphragm pump	Small electric pump that uses a circular diaphragm to create suction pressure	Relatively small and quiet Double or single pumping	May be difficult to achieve enough suction pressure to empty breast fully With most models, only manual cycling Requires electricity or car battery (with adapter option)	120 to 160
Electric piston pump	Medium-sized electric pump that uses a piston moving back and forth in a chamber to create suction pressure	Efficient and compact: usually has optional carrying case (size of a briefcase or backpack) Double or single pumping Automatic cycling	More expensive Requires electricity or car battery (with adapter option)	170 to 300
Hospital-grade electric piston pump	Large piston-driven electric pump that creates physiologic suction pressures and rates	Highly efficient: most accurately recreates baby's suction pressure and cycling rate Double or single pumping Automatic cycling	Large and heavy Highly expensive: usually only practical to rent this type of pump Requires electricity	700 to 800; rental: 40 to 60 per month plus supplies

**—Cost information obtained from various Web sites, including http://www.medela.com, http://www.baileymed.com, http://www.nursingmothersupplies.com, and http://www.babiesrus.com.*

quently the mother and infant will be separated (i.e., for only one feeding a day or for several feedings a day), the available facilities (i.e., access to electricity), and the cost of the pump *(Tables 4 and 5)*. Electric piston double pumps are portable and work quickly and efficiently. These pumps may be most successful for maintaining the milk supply in a mother who works outside the home for more than 20 hours per week and does not have a history of poor milk supply.[16,17] However, pump recommendations are quite flexible, because any pump can work in any situation. Indeed, a highly motivated mother may be able to do well with only a manual pump.

Milk Storage

Guidelines vary on how long human breast milk can be stored at certain temperatures. A conservative approach is to store breast milk at

room temperature (25°C [77°F]) for four to eight hours,[11,16,18-20] in the refrigerator for three to eight days,[11,16,18,20] in a refrigerator-freezer unit with a separate freezer door for three to six months,[11,16] and in a separate freezer chest (−20°C [−4°F]) for 12 months.[11,16,20] The La Leche League's guidelines allow for storage of breast milk at room temperature for up to 10 hours, in a refrigerator for up to eight days, and in a freezer compartment inside a refrigerator for up to two weeks.[21] [Evidence level C: consensus/expert guidelines]

While fresh breast milk has the highest quality, most of the milk's protective and nutritive value is maintained despite refrigeration or freezing.[22] It is best to store breast milk at the back of the refrigerator or freezer, because the temperature at the door is more variable.

Daily portions of breast milk can be stored in clean plastic or glass bottles. Breast milk can be "layered" in one bottle in the freezer (i.e., by adding fresh milk to the top of the frozen supply) as long as the amount of nonfrozen milk is less than the amount that is already frozen (to prevent thawing and refreezing of the milk).[23] Breast milk is best stored in portions that will be used in one day. Once the breast milk has been thawed, it should be used within the next day or two.

Frozen breast milk should not be thawed in a microwave oven. Once the milk has been thawed, it should not be refrozen. Microwaving or refreezing can destroy valuable proteins in breast milk.

Parents and other caregivers of breastfed infants need to understand that breast milk separates when it is stored, with the fat floating on the top. Separation of breast milk is normal and not a sign of spoiling. Shaking the milk before serving it will re-emulsify the fat adequately.

TABLE 5
Choice of Breast Pump*

Type of pump	*Mother staying at home; occasionally separated from infant for more than 4 hours*	*Mother working part time†; infant less than 6 months of age*	*Mother working part time†; infant more than 6 months of age*	*Mother working full time‡; infant less than 6 months of age*	*Mother working full time‡; infant more than 6 months of age*	*Mother having problems with milk supply or nipple pain*
Manual pump	X		X		X	
Battery-powered pump	X		X		X	
Electric diaphragm pump	X	X	X		X	
Electric piston pump	X	X§	X	X§	X§	X
Hospital-grade electric piston pump				X		X§

**—"X" indicates the best choice for the given situation. However, any pump may work in any situation if a mother is motivated; therefore, a trial of a less expensive pump may be feasible. The choice of pump must take into account the facilities that are available for pumping. If electricity is not available, a car battery adapter set, a manual pump, or a battery-powered pump would be needed. Note that all pumps have been successful with mothers who stay at home and with mothers who work part time and have older infants.*
†—"Part time" refers to work for less than 4 hours per day.
‡—"Full time" refers to work for more than 4 hours per day.
§—This is the most commonly successful pump in the given situation.

Frozen breast milk should be thawed slowly in the refrigerator or by swirling the bottle or bag in tepid water. Breast milk should not be thawed in a microwave oven. Once the milk has been thawed, it should not be refrozen. Microwaving or refreezing can destroy valuable proteins in breast milk.

Although pumped breast milk can be stored at room temperature for four to eight hours at the work site, cooling the milk delays lipolysis. If a refrigerator is not available, the breast milk can be stored for up to 24 hours in a portable cooler with ice packs.[18] The Occupational Safety and Health Administration states that "exposure to breast milk does not constitute an occupational hazard."[24] This information should help allay employers' fears about storage of breast milk in the common refrigerator at the workplace.

Counseling Issues

A breastfeeding plan can help the working mother anticipate logistic problems and devise a practical pumping schedule. In formulating the initial plan, the mother needs to consider whether the infant can visit the work site for breastfeeding, where and how frequently feeding or breast milk pumping can be done, what her break schedule and work hours are, and what difficulties she may encounter with breastfeeding or breast milk pumping in her work environment. The breastfeeding plan needs to be flexible to allow for necessary changes based on unexpected factors. A checklist for returning to work is provided in the patient information handout that accompanies this article.

There are many breastfeeding options for mothers who return to work. The infant can be brought to the mother to be breastfed at the work place. The mother can pump or hand express breast milk that is fed to the infant in her absence. The infant can be fed formula in part or in full while the mother is at work and then breastfed when the mother is home. With an older child, the mother can "reverse-cycle feed"; with this option, the mother breastfeeds the child more frequently at night, and the child is fed expressed breast milk, formula, or other food while the mother is at work. A family should choose whichever method or combination of methods is best for the work and home situation, and plan ahead to increase the likelihood of success.

Workload and finances often dictate when a mother returns to work and how many hours per week she works. It is best to delay returning to work until breastfeeding is well established. Longer maternity leaves correlate with a longer duration of breastfeeding.[6] If possible, a maternity leave of at least six weeks is recommended.

Working part time is recommended, if it is an option. Mothers who work less than 20 hours a week breastfeed longer, and mothers who work part time are more likely to breastfeed for longer than one year.[5,22,25] Another option is to work part time for a few days or weeks before returning to a full-time schedule. Starting back to work in the middle of the week (i.e., on Wednesday or Thursday) may ease the transition.

As early as possible, the proposed work and breastfeeding plan should be discussed with the employer. Issues for discussion include work schedules, employer and coworker expectations, time and duration of work breaks, breast milk pumping locations and facilities, and storage of breast milk.

About two weeks before the return-to-work date, the mother should practice her planned routine in the less stressful home environment. If she plans to pump breast milk, she should practice to develop the quickest, most successful technique. The mother also must become familiar with pumping and storage equipment, storage methods, and techniques for cleaning equipment. At this point, the mother should begin stockpiling stored milk.

The breastfeeding mother needs to understand the "supply and demand concept" of milk supply. A positive feedback loop stimulates the breast to create more milk: that is, the emptier the breast becomes, the more it is

stimulated to create more milk.[23] Before returning to work, the mother can create a milk supply by emptying her breasts more frequently (i.e., pumping between breastfeeding sessions) or more thoroughly (i.e., pumping after the infant has finished breastfeeding).

When the mother is starting to create a milk supply, the initial days will result in only small collections of extra milk. As little as one teaspoon is not uncommon in the first few trials of pumping.[23] The physician should warn the mother about this, so that she does not become disappointed or consider her efforts to have failed. As the positive feedback loop works, milk production increases, and more milk can be collected for storage.

Once the mother returns to work, she should be encouraged to call the physician's office or come in for an appointment to discuss any breastfeeding problems. If caught early, a dwindling milk supply is easier to rebuild.

If the mother has no problems with milk supply, has no pain with breastfeeding, and is producing a full supply of milk, bottle feeding can be practiced once the infant reaches the age of at least four weeks. Introducing a bottle too early can cause nipple confusion. Compared with breastfeeding, feeding from a bottle requires less suction and less coordination of tongue movements; therefore, a very young infant may become frustrated when placed back on the breast. By four to six weeks of age, most infants have learned the breastfeeding technique well enough that they do not experience nipple confusion if they are introduced to a bottle. Introduction of a bottle should be delayed until the milk supply is well established and should be initiated only if there are no breastfeeding problems. Cup feeding is an alternative until this time.

In addition to planning for the first day of work, the mother needs to have a plan to cover necessary trips. A weekend trip or a flight out of town can be enough to diminish a mother's milk supply. A manual or battery-powered pump or hand expression can be used in travel situations. If the milk cannot be stored conveniently, the mother should express the milk and then discard it ("pump and dump"). Planned breaks for emptying the breasts can prevent embarrassing breast leaks and maintain the maternal milk supply during these temporary absences.

It may be helpful to remind parents that working outside the home and being a parent are actually two jobs. Frustration and fatigue are common. Extra support in doing household chores is needed, and some chores may need to be neglected. The family should be encouraged to talk about what changes to expect when the mother returns to work.

Final Comment

Leaving a newborn to return to work can be highly emotional for a mother. Although continuing to breastfeed while working can present many challenges, most of these challenges can be addressed. Advance planning can prevent problems that could lead to discontinuance of breastfeeding during the stressful transition time.

The rewards of breastfeeding outweigh the obstacles. Providing breast milk for an infant often helps a mother maintain an emotional connection with the infant and a sense of dedication to the infant's well-being, despite her physical absence. Family physicians and other health care professionals can support and encourage continued breastfeeding in working mothers by providing education about return-to-work plans, breast milk pumping, and breast milk storage.

The author indicates that she does not have any conflicts of interest. Sources of funding: none reported.

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