

# When to Wean: Biological Versus Cultural Perspectives

KATHERINE A. DETTWYLER, PhD

*Department of Anthropology, Texas A&M University, College  
Station, Texas*

Obstetricians and gynecologists play an important role in providing breastfeeding information and support to women before, during, and after pregnancy and continuing through their reproductive years. Research confirms that a clear preference for breastfeeding on the part of the physician and hospital staff, and breastfeeding-supportive labor/delivery/postpartum treatment of the mother and newborn can increase both the incidence and duration of breastfeeding.<sup>1,2</sup> Although "infant feeding decisions" may be perceived as being the sole responsibility of the pediatrician or family practice physician, women often receive their first exposure to information about appropriate breastfeeding practices, including duration, from their obstetrician/gynecologist. Most women establish their breastfeeding goals before or during pregnancy and may be influenced by their health care provider's recommendations, educational literature/teaching, and by commercial handouts. Obstetricians and gynecologists also are involved in

dealing with the cumulative short-term and long-term health consequences of a woman's decisions about whether and for how long to breastfeed.

Breastfeeding is both a biological process and a heavily culturized activity. As a biological process, breastfeeding is firmly grounded in our mammalian ancestry and is critical to the survival of the species. From a biological perspective, modern human children are adapted to be breastfed for a number of years. However, from a cultural perspective, the duration of breastfeeding may be modified by a variety of beliefs about infant/child health and nutrition, child spacing, the nature of human infancy, and the proper relationships between mother and child, mother and father, and mother and society.<sup>3</sup> In addition, the duration of breastfeeding is affected by such disparate influences as religious beliefs, the structure of the mother's everyday work activities, the health of the child, and seemingly unrelated ideas about personal independence and autonomy. Among women, perceptions of the appropriate duration of breastfeeding may be influenced by local, regional, ethnic, or class-based differences in cultural beliefs

*Correspondence: Kathy Dettwyler, PhD, One Orchard Avenue, Newark, DE 19711-5523. E-mail: kadettwyler@hotmail.com*

and access to knowledge. Likewise, an individual health care professional's personal opinions or experiences as well as their use of commercial marketing materials may affect the advice and support they offer to their patients.

Patients may ask their obstetricians and gynecologists for information and advice about continuing to breastfeed while evaluating options for family planning, when maternal medications are needed during lactation, when she becomes pregnant again, and when she is considering tandem nursing her toddler and a newborn. Patients may seek their physician's advice about lactation and mammograms, elective breast surgeries, breast cancer risks and treatment, fertility concerns, and osteoporosis. It is imperative that obstetricians and gynecologists know what the current expert recommendations are with respect to breastfeeding duration, understand the implications of these recommendations for the health of mothers and children, and support a mother's decision to breastfeed her child as long as she is willing and able to do so.

Extended breastfeeding is defined as breastfeeding for longer than 3 years. There are many populations around the world where extended breastfeeding is the norm. In the United States, there are both many individual women nursing older children across the country, as well as pockets of support where groups of women all practice extended breastfeeding and support one another's decisions.

Many women in the United States who practice extended breastfeeding conceal this fact from their health care providers (as well as from relatives, coworkers, neighbors, and friends). A woman may be concerned that her health care provider will disapprove and try to convince her to wean the child. Or she may be worried that someone will report her to child protective services, alleging child abuse. Unfortunately, the widespread cultural definition of breasts as sex objects in the United States has led some people to view breastfeeding the older child as inap-

propriate sexual behavior between parent and child, including some social workers, police departments, and judges. Over the past 2 decades, a number of women have been accused of sexual abuse of their children simply for breastfeeding them for various lengths of time deemed inappropriate by others, including mothers of children as young as 2 months of age. Extended breastfeeding may also become an issue in divorce and child custody cases, where the father or other family members try to use the extended breastfeeding as a means of portraying the mother as unfit to maintain custody. Although no formal studies of this issue have been conducted to date, the author's experiences over the past 20 years suggest that around 8 to 10 women each year in the United States are accused of inappropriate sexual contact with their older child by virtue of the breastfeeding relationship alone (author's personal files and personal communications with Elizabeth Baldwin throughout the 1990s and until her death in 2003).

Because women in the U.S. are often stigmatized for nursing their child longer than the cultural norm, they may be unwilling to share this information with their gynecologist or obstetrician. It is critical that physicians make clear to their patients that extended breastfeeding is accepted and supported, so that open communication can be assured.

In this chapter, I begin with a discussion of the current expert recommendations with respect to breastfeeding duration from the World Health Organization, the American Academy of Pediatrics, the American Association of Family Physicians, the American College of Obstetricians and Gynecologists, and the United States Public Health Service's Healthy People 2010 program. I then present a brief overview of my research on a biological perspective on weaning, which establishes the range for a natural age of weaning in modern humans from other life history variables, based on the relationship between those variables and age at weaning

in the nonhuman primates. This research suggests that human children are biologically programed to be breastfed for a minimum of 2.5 years, and up to a maximum of about 7 years.<sup>4,5</sup> Thus, the biological perspective is quite different from the typical cultural perspective that a few weeks or months of breastfeeding, or at most a year, is normal and sufficient. I then present the preliminary results of my research on extended breastfeeding in the United States. I conclude with a list of what every well-informed obstetrician/gynecologist should know about extended lactation and breastfeeding.

## ***Current Expert Recommendations on Duration of Breastfeeding***

### **WORLD HEALTH ORGANIZATION**

Since 1979, the World Health Organization (WHO) has recommended that all children throughout the world be breastfed for a minimum of 2 years of age, with no defined upper limit on duration of breastfeeding (Table 1). These recommendations were developed with the full range of living conditions found throughout the world. They apply to children in the United States as well as

**TABLE 1. Recommendations on Duration of Breastfeeding**

Organization	Recommendation
World Health Organization <sup>6</sup>	As a global public health recommendation, infants should be exclusively breastfed for the first 6 mos of life to achieve optimal growth, development, and health. Thereafter, to meet their evolving nutritional requirements, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to 2 yrs of age or beyond.
American Academy of Pediatrics <sup>7</sup>	Exclusive breastfeeding is ideal nutrition and sufficient to support optimal growth and development for approximately the first 6 months after birth. It is recommended that breastfeeding continue for at least 12 mos, and thereafter for as long as mutually desired.
American Academy of Family Physicians <sup>8</sup>	The AAFP recommends that all babies, with rare exceptions, be breastfed and/or receive expressed human milk exclusively for about the first 6 mos of life. Breastfeeding should continue with the addition of complementary foods throughout the second half of the first year. Breastfeeding beyond the first year offers considerable benefits to both mother and child, and should continue as long as mutually desired. Nursing beyond infancy: breastfeeding should ideally continue beyond infancy, but this is currently not the cultural norm and requires ongoing support and encouragement. Breastfeeding during a subsequent pregnancy is not unusual. If the pregnancy is normal and the mother is healthy, breastfeeding during pregnancy is the woman's personal decision. If the child is younger than 2 yrs of age, the child is at increased risk of illness if weaned. Breastfeeding the nursing child after delivery of the next child (tandem nursing) may help to provide a smooth transition psychologically for the older child.
American College of Obstetricians and Gynecologists <sup>9</sup>	The ACOG recommends that exclusive breastfeeding be continued until the infant is about 6 mos old. A longer breastfeeding experience is, of course, beneficial. The professional objectives are to encourage and enable as many women as possible to breastfeed and to help them continue as long as possible.
Healthy People 2010 <sup>10</sup>	Increase in mothers who breastfeed, 1998 to 2010 goal Objective 16-19a. In early postpartum period, from 64 to 75% Objective 16-19b. At 6 months, from 29 to 50% Objective 16-19c. At 1 year, from 16 to 25%

children in the most adverse third world conditions. The full text of the WHO recommendations, and supporting references, can be found on their website.<sup>6</sup>

#### **AMERICAN ACADEMY OF PEDIATRICS**

Since 1997, the American Academy of Pediatrics (AAP) has recommended that all children in the United States be breastfed for a minimum of 12 months, with no defined upper limit on duration of breastfeeding (Table 1). The 2 parties involved in the "as long as mutually desired" part of their recommendations refer to the mother and the child. As with the WHO's recommendations, the AAP deliberately decided not to specify any upper age limit on the appropriate duration of breastfeeding, leaving that decision to the mother and the child. The full text of their current recommendations, and supporting references, can be found on their website.<sup>7</sup>

#### **AMERICAN ACADEMY OF FAMILY PHYSICIANS**

The American Academy of Family Physicians (AAFP) statement is among the strongest and most explicit in support of breastfeeding. The AAFP recommends that all children in the United States be breastfed for a minimum of 12 months, with no defined upper limit on duration of breastfeeding (Table 1). The AAFP statement further confirms that any duration of breastfeeding short of 2 years increases the child's risk of disease. Additionally, the AAFP policy statement specifically encourages continuing to breastfeed throughout a subsequent pregnancy, and then tandem nursing the toddler and newborn. The full text of their current recommendations, and supporting references, can be found on their website.<sup>8</sup>

#### **AMERICAN COLLEGE OF OBSTETRICIANS AND GYNECOLOGISTS**

The most recent statement from the American College of Obstetricians and Gynecologists (ACOG) concerning duration of

breastfeeding is found in an educational bulletin from 2000 (#258) titled "Breastfeeding: Maternal and Infant Aspects."<sup>9</sup> The ACOG states that its members' "professional objectives are to encourage and enable as many women as possible to breastfeed and to help them continue as long as possible." (Table 1).

#### **U.S. PUBLIC HEALTH SERVICE'S HEALTHY PEOPLE 2010**

"Healthy People 2010" presents 467 objectives to improve the health of Americans by the year 2010. Among these objectives are 3 relating to target goals for the proportion of mothers breastfeeding at various durations postpartum. The goal for 1 year of age is to have 25% of mothers continuing to breastfeed, with no further goals specified for longer than 1 year, and no upper limit of breastfeeding duration defined (Table 1). The full list of objectives, recommendations, and supporting references, can be found on their website.<sup>10</sup>

### ***A Natural Age of Weaning***

In the early 1990s, I began looking at the question of how long human children would breastfeed (or be breastfed) if they followed a natural or physiological pattern based on our evolutionary history as large-bodied, large-brained, long-lived mammalian primates, rather than being heavily or solely influenced by cultural beliefs about appropriate durations of breastfeeding.<sup>4</sup> My interest in the question stemmed from my reading of the anthropological research literature, my research on breastfeeding in Mali, West Africa, and my personal experiences of breastfeeding for longer than the cultural norm in the United States during the 1980s and early 1990s. The anthropological literature reported that many children around the world were (and are) breastfed for 3 to 5 years or longer, depending on local cultural beliefs. In Mali, most children breastfeed for about 2 years. In the United States, many children



breastfeed for only a few weeks or months, if they breastfeed at all. In the early 1990s, and still in 2004, breastfeeding beyond 1 year of age in the U.S. is considered fairly radical in some circles.

#### PRIMATE LIFE HISTORY VARIABLES

The answer to the question of how long human children would breastfeed (or be breastfed) if they followed a natural or physiological pattern, not influenced by cultural beliefs, lies in an examination of the nonhuman primate data on life history variables. In zoological research, life history variables refer to the length and characteristics of various stages of the primate life span, beginning with the prenatal period, defined as the average length of gestation. The next stage is infancy, defined as lasting from birth until the eruption of the first permanent teeth. The juvenile stage lasts from the eruption of the first permanent tooth until the eruption of the last permanent tooth. The adult period begins with the eruption of the last permanent tooth and continues to the end of mean longevity for the species. The reproductive period in females can be defined in various ways; often, data are available on average age of reproductive maturity for females as measured by menarche (first menstrual cycle or first estrous) and average age at first breeding or birth. The postreproductive period in females lasts from menopause until the end of mean longevity. Life history variables also include various size and growth rate variables, such as adult female weight, adult male weight, birth weight, number of offspring born at one time, weaning age (duration of breastfeeding), length of the estrous cycle, interbirth interval, brain weight at birth, brain weight in adults, and rates of growth as measured by either multiples of birth weight or percent completion toward adult weight. Research has shown that many life history variables are strongly correlated with each other, and with adult body size.

Members of the order primates have longer stages of the life span, and longer life spans, than members of other orders of pla-

cental mammals. Within the order, several trends can be identified, most of which are related to body size. Comparing the durations of life stages in lemurs (representing prosimians), macaques (Old World Monkeys), gibbons (Lesser Apes), chimpanzees (Great Apes), and humans reveals a clear pattern. As one moves from the simpler, smaller, mostly nocturnal and often solitary prosimians up through the more complex, larger, diurnal, more intelligent and usually more social higher primates, every segment of the life span is elongated. Gestation length increases from 18 weeks in the lemur to 24 in the macaque, 30 in the gibbon, 33 in the chimpanzee, and 38 in modern humans. Durations of other segments of the life span likewise increase, from eruption of the first permanent teeth to eruption of the last permanent teeth, to duration of the reproductive period, and finally elongation of the postreproductive period in humans, resulting in the longest average life spans for humans. In other words, every segment of the life span is elongated in primates compared to other placental mammals, and every segment of the life span not subject to cultural manipulation is elongated in humans compared with nonhuman primates.

According to British researchers Harvey and Clutton-Brock, "larger primates wean their offspring later relative to their body size than is the case for other mammalian orders."<sup>11</sup> Within the order, primate subfamilies that have relatively large neonates (high birth weight to adult weight ratios) have relatively long gestations, late age at sexual maturity, long life spans, and large neonatal and adult brain sizes, when compared to subfamilies that have relatively small neonates. Additionally, primate subfamilies with relatively large offspring wean them at a later age than subfamilies with relatively small offspring. Thus, we would expect humans, as large primates with relatively large neonates, to have among the latest weaning ages of the order.

### WEANING ACCORDING TO ADULT FEMALE BODY WEIGHT

Harvey and Clutton-Brock also found that many life history variables in primates were closely tied to average adult body size within each subfamily.<sup>11</sup> From their data, they derived regression equations for the prediction of the various life history variables as a function of adult female body weight. Their equation for calculation of weaning age is: weaning age in days =  $2.71 \times \text{adult female body weight in grams}$ .<sup>56</sup>

Human populations occupy many different ecological niches and exhibit greater variation in average body weight than non-human primate species that live within a restricted environmental range. Thus, I used several different human populations to include the range of variation in adult female body weight in modern humans.<sup>4</sup> For the small-bodied !Kung people, with an average adult female body weight of 40.10 kg, the regression equation predicts an age at weaning of 2.80 years. For the medium-bodied rural Malians, with an average adult female body weight of 53.60 kg, the regression equation predicts an age at weaning of 3.30 years. For the large-bodied United States population, with an average adult female body weight of 55.35 kg, the regression equation predicts an age at weaning of 3.36 years. For the extra-large-bodied Inuit people, with an average adult female body weight of 64.50 kg, the regression equation predicts an age at weaning of 3.66 years. Thus, using Harvey and Clutton-Brock's equation, a natural age at weaning in modern humans would fall between 2.8 and 3.7 years, depending on average adult female body weight.<sup>4</sup>

### WEANING ACCORDING TO ATTAINMENT OF ONE-THIRD ADULT WEIGHT

The exact nature of the link between age at weaning and rate of growth is not known, but seems strong across a variety of mammalian species. According to Charnov and Berrigan, "On average, primates are like

other mammals in weaning each offspring when they reach about one-third their adult weight."<sup>12</sup> What does this mean for humans?

The natural ages at weaning for Inuit (extra-large), U.S. (large), and Malian (medium) children predicted by growth patterns and adult body size are remarkably consistent. Across these 3 populations, children reach one-third their adult weight at approximately 7 years of age for males and 6 years of age for females. In the smaller-bodied !Kung populations, one-third adult body weight is reached earlier, at 5 to 6 years for males and 4 to 5 years for females. Following Charnov and Berrigan's<sup>12</sup> suggestion that primates generally wean their offspring when they reach one-third adult weight, then 4 to 7 years of breastfeeding is the appropriate range for *Homo sapiens*, with boys generally being weaned later than girls.

### WEANING ACCORDING TO SPECIFIC MULTIPLICATION OF BIRTH WEIGHT

Lee et al studied the link between age at weaning and the attainment of "a critical or threshold body weight attained by offspring among large-bodied mammals: the anthropoid primates, ungulates, and pinnipeds."<sup>13</sup> Among these large-bodied mammals, Lee et al found that weaning occurred when offspring had quadrupled their birth weight. When do human children quadruple their birth weight? According to the NCHS standards for U.S. populations,<sup>14</sup> the 50th percentile for birth weight for males is 3.27 kg. A quadrupling of that birth weight, to 13.08 kg, occurs at around 27 months of age (50th percentile). For females, the figures are 3.23 kg at birth, with a quadrupling of birth weight to 12.92 kg at around 30 months. Thus, for the U.S., quadrupling of birth weight usually is achieved sometime between 2 and 3 years of age. The author's growth data from Mali, West Africa (1981–1983), are based on a much smaller sample and come from a periurban population. Most of these children have little or no access to

modern medical care, have no access to immunizations, and suffer from many diseases, particularly measles, malaria, and gastrointestinal and upper respiratory infections. In Mali, the average female quadrupled her birth weight at about 3 years of age and the average male at about 3 years 3 months.

In their study, Lee et al report that in many primate species, quadrupling of birth weight correlates with return of fertility in the mother, but that this "... generally does not correspond to 'weaning' defined as the cessation of suckling, since suckling at low levels in many species continues through pregnancy until subsequent parturition."<sup>13</sup> Thus, for modern humans, a natural age of weaning (complete cessation of breastfeeding) would be some months after quadrupling of birth weight, close to 3 years of age for well-nourished, healthy populations, and between 3 and 4 years of age for marginally nourished populations dealing with multiple environmental stresses.

#### **WEANING ACCORDING TO GESTATION LENGTH**

The data from nonhuman primates suggest that the relationship between these 2 life history variables is heavily dependent on adult body size. Harvey and Clutton-Brock provide data on life history variables for 135 primate species<sup>11</sup>; 36 entries include information on both length of gestation and weaning age. Among the smaller-bodied primates, the weaning age to length of gestation ratio is less than 1.00 (the duration of breastfeeding is shorter than the length of gestation). For all of the larger-bodied primates (monkeys and apes), the weaning age to length of gestation ratio is greater than 1.00 (the duration of breastfeeding is longer than the length of gestation). Among the Great Apes, the closest living relatives of humans, the ratios are 4.21 for the orangutan, 6.18 for gorilla, and 6.40 for the common chimpanzee. Among large-bodied primate species, the average duration of breastfeeding far exceeds the average length of gestation. For humankind's closest rela-

tives, chimpanzees and gorillas, the duration of breastfeeding is more than 6 times the length of gestation. From these comparisons, an estimated natural age at weaning for humans would be 6 times gestation length, 4.5 years, or a little longer.

#### **WEANING ACCORDING TO TIMING OF ERUPTION OF THE FIRST PERMANENT MOLARS**

Research by anthropologist Holly Smith has examined the relationship between timing of dental eruption and age at weaning in 21 different primate species.<sup>4,15</sup> Smith finds that in many primates these events occur simultaneously. That is, the offspring are weaned when their first permanent molars are erupting. In chimpanzees, however, because they have relatively early eruption of the first permanent molars, first molar eruption often occurs several years before the end of breastfeeding. In modern humans, the first permanent molars erupt around 5.5 to 6.5 years of age.

#### **WEANING ACCORDING TO AGE AT FIRST BREEDING FOR FEMALES**

Harvey and Clutton-Brock's data on nonhuman primates show a close correlation between age at weaning and age of reproductive maturity, measured either as "sexual maturity," meaning first ovulation or estrous (menarche in humans), or as "average age at first breeding for females."<sup>11</sup> Both are related to body size, with larger-bodied species having longer durations of breastfeeding and later ages at reproductive maturity. For example, gorillas breastfeed for about 4 to 5 years, and females give birth to their first offspring at about 10 years of age. Chimpanzees breastfeed for 4.5 to 7 years (Harvey and Clutton-Brock use 4 years), and females give birth to their first offspring at about 11 to 12 years (some sources cite 14 to 15 years). From Harvey and Clutton-Brock, 28 species provide data for both age at weaning and age at first breeding for females.<sup>11</sup> The correlation between these 2 variables is quite high,  $R = 0.89$ . The regression equation for predicting age at weaning from age

at first breeding is: weaning age in days =  $1.4493 \times \text{age at first breeding in months}$ .<sup>1,34,50</sup>

Again, we are faced with the difficulty of deciding when would be a natural or normal "age at first breeding" for modern humans. It is well documented that age at menarche (first menstrual period) becomes progressively younger as health and nutritional status during childhood improve.<sup>4,5</sup> Women in populations living under adverse environmental conditions may not experience menarche until their late teens, whereas the average age of menarche for Western industrial countries seems to have stabilized at an average of about 12 to 13 years. At the same time, age at marriage and age at first birth are highly influenced by cultural norms, which are themselves affected by political and economic conditions. If we use 20 years as the average age at first breeding for modern humans, the regression equation predicts an average duration of breastfeeding of 6.31 years. If we assume that the average age at first breeding is 16 years of age, the regression equation predicts an average duration of breastfeeding of 4.68 years. If we assume that the average age at first breeding is 12 years of age, the regression equation predicts an average duration of breastfeeding of 3.18 years. Thus, even under optimal childhood conditions, the lowest predicted duration of breastfeeding would be more than 3 years.

#### SUMMARY OF THE LIFE HISTORY COMPARISONS

An examination of the relationships between age at weaning and various life history variables among the nonhuman primates has revealed that, if humans weaned their offspring according to the primate pattern, without regard to cultural beliefs and customs, most children would be weaned somewhere between 2.5 and 7.0 years of age.

In humans, several physiological milestones occur around 6 to 7 years of age, all of which can be linked logically to having breast milk as a component of the diet

throughout this period. First, achievement of adult immune competence occurs at approximately 6 years of age. Until this time, the child's active immune response (both serum and secretory) can be enhanced by the lymphokines in maternal milk.<sup>16,17</sup> Children need these lymphokines, even in small amounts, to augment and prime their own immune responses to stress until they achieve adult levels of immune competence (IgA, IgG, IgM) around the age of 6 years (Doren Fredrickson, personal communication). Second, recent research suggests that brain growth in weight is complete at an average of 6 to 7 years of age.<sup>4,5</sup> Several long-chain polyunsaturated fatty acids (LC-PUFAs) are critical constituents of brain growth and retinal development.<sup>18</sup> Two of these, docosahexanoic acid and arachidonic acid, have been added to some artificial infant formulas and are found in relatively few other foods, such as tuna and other cold-water ocean fish. It makes sense that breast milk would be a part of the diet as long as the brain was still growing, especially under evolutionary conditions where the non-breast milk components of the diet were low in these nutrients and where populations were subject to periodic dietary deficiencies. Third, developmental psychologists have long noted that a qualitative change in intellectual processing takes place at around 7 years of age. Piaget referred to this as a change from primarily preoperational thought to primarily concrete operational thought. Fourth, Smith suggests that the eruption of the first permanent molar "should enhance a juvenile's ability to process food."<sup>15</sup> These factors support the idea that the first 6 or 7 years of a human child's life represent a time when the child is still dependent on maternal care, including maternal breast milk, for optimal development.

#### *Extended Breastfeeding in the United States*

Accurate longitudinal data on the incidence of extended breastfeeding in the United



States are not available. Most statistics on breastfeeding duration are collected by the infant formula companies and extend only to a category of "over 13 months." Thus, it is not possible to state with accuracy how many women in the U.S. are practicing extended nursing at any particular time. From 1995 to 2000, I collected data on women and children in the United States who had breastfed for a minimum of 3 years. Over 1000 women responded to the survey. At the close of data collection, the sample included 1280 children who had been breastfed for a minimum of 3 years, most during the 1990s, but some in the 1980s and earlier. The range of weaning ages was from 3 years to 9.17 years. The average age of weaning was 4.24 years, with a median of 4.00, a mode of 3.50, and a standard deviation of 1.08 years. Close to half of the children weaned between 3.00 and 4.00 years of age. Children whose weaning was characterized as "child led" weaned at an average age of 4.39 years, whereas those whose weaning was characterized as "mother led" were weaned at an average age of 3.83 years.

The demographic characteristics of the sample indicate that in the United States, extended breastfeeding is most often found among middle-class and upper-class women, women who work outside the home, and women who are highly educated. The majority characterized themselves as being of middle-class or upper-class in terms of socioeconomic status and working full-time outside the home. More than 50% of the mothers were college graduates, and the sample included numerous women with advanced degrees (MA, PhD, MD, DVM), and many with higher levels of education than their spouses. Of those who responded to the question on ethnicity of the mother, most said they were European-American. These characteristics mirror those found in previous studies of extended breastfeeding in the U.S.<sup>19-22</sup> Approximately two-thirds of the mothers became pregnant again while nursing, and, of those, more than half continued to nurse during the pregnancy and

then tandem nursed both children. The average duration of tandem nursing was 1.62 years, with a standard deviation of 1.12 years. Sixty percent of the mothers said they knew only a few other mothers in the community who were nursing children past the age of 3 years. Thirteen percent said they were the only one they knew, whereas 20% said there were many people in their community practicing extended breastfeeding. Areas of the country with relatively large groups of mothers and children nursing beyond 3 years of age included Seattle, Washington; Salt Lake City, Utah; College Station, Texas; and Wilmington, Delaware.

## *Discussion*

### **CULTURAL INFLUENCES ON PRIMATE LIFE HISTORY VARIABLES**

Extended breastfeeding, from a minimum of 2.5 years to a maximum of about 7 years, is healthy, physiologically normal, and evolutionarily adaptive. It optimally meets the needs of children for nutritional, immunologic, and emotional sustenance until they are ready and able to meet those needs on their own. Duration of breastfeeding is the only life history variable that is subject to direct and substantial cultural intervention and the only one for which routine shortening or complete elimination has become accepted as the cultural norm in some populations. Close to a third of all children born in the United States are effectively weaned at birth, because they are never put to their mother's breast. Of the 60% to 70% who begin life breastfeeding, most will no longer be breastfeeding by 6 months postpartum. Although some children in the United States breastfeed longer than 3 years, most are weaned before 2.5 years, the minimum age of natural weaning. This pattern of premature or early weaning can be traced to direct cultural influences, including the recommendations found in baby/parenting books and magazines, advice offered by health care professionals, literature provided by infant formula companies, and pressure from



family members, coworkers, friends, and even complete strangers to end the breastfeeding relationship.

#### **IMPLICATIONS FOR CLINICAL PRACTICE: UNTIL WHAT AGE SHOULD WE ADVOCATE THAT BREASTFEEDING CONTINUE?**

In helping a breastfeeding mother, health care professionals ethically are obligated to present the normal physiological duration of breastfeeding for the species, and the risks of premature weaning, and then let the mother decide. The importance of the biological perspective is not to recommend that all mothers should breastfeed their children for a particular length of time. The importance of the anthropological perspective is to de-pathologize species-normal breastfeeding and weaning patterns that are still practiced by many mothers and children today, whether in remote rural villages in Mali or Peru or New Guinea, or in Seattle, Salt Lake City, College Station, and Wilmington.

In choosing whether, and for how long, to breastfeed, women are making decisions that will have long-lasting consequences for their children's health, as well as their own. When they are making those decisions, they should have complete and accurate information about the consequences for their child's health, and their own health, of weaning at different ages, and accurate information about what durations of breastfeeding are physiologically normal for humans—2.5 years to 7.0 years. Without accurate information, women are not able to make informed choices. Without accurate information, they may be basing their decisions on their own or their physician's cultural perspectives, which may have little to do with the biological reality of humans as a species. To be successful at extended breastfeeding in a cultural milieu that may be hostile, women need and deserve the support of health care professionals.

Each mother should be allowed to make her own decision about whether and for how long to breastfeed her child, based on a num-

ber of factors that she must take into account, including her own personal feelings about breastfeeding, her child's temperament, her work or school situation, her support system, her other children, her health, and other variables. Although not every woman will choose to breastfeed for 2.5 years or longer, all women deserve to be empowered to breastfeed, and empowered to continue to breastfeed as long as they and their children desire.

#### **Summary and Recommendations**

What every well-informed obstetrician/gynecologist should know about extended lactation and breastfeeding:

- From a biological perspective, breastfeeding a child for 2.5 to 7.0 years is normal for our species.
- For most mother-child pairs, cultural beliefs drive the age of weaning prior to 2.5 years.
- Children benefit from breastfeeding—nutritionally, immunologically, and emotionally—as long as breastfeeding continues.
- In the United States, the incidence of extended breastfeeding is not known, but is estimated to be less than 2% of all children. Some children in the U.S. breastfeed for the species norm of 2.5 to 7.0 years, and some even longer. In the U.S., extended breastfeeding is most often found among middle-class and upper-class women, women who work outside the home, and women who are highly educated.
- The frequency of nursing tends to decline as the child gets older. Despite a greatly reduced frequency of nursing (1–4+ times a day), the ability to produce milk and increase supply remains.
- It is possible for well-nourished mothers to experience 2 to 3 years of lactational amenorrhea if their child breastfeeds often, especially if the child breastfeeds a lot at night.<sup>22–24</sup>
- Lactational amenorrhea may return during periods of increased nursing frequency.
- It is possible for women to become pregnant while breastfeeding, continue breastfeeding during the pregnancy, and then tandem nurse the older child and the newborn. Sometimes mothers will wean the older child during the

latter stages of the subsequent pregnancy, and then tandem nurse once the newborn has arrived.<sup>22-24</sup>

- There is no research to support the idea that extended nursing harms the mother, and there are some data suggesting that longer lifetime durations of breastfeeding reduce breast cancer risk.
- The view that breasts are sex objects, and the role of breasts in sexual behavior among adults in Western countries are purely cultural phenomena.<sup>3-5</sup> Breastfeeding an older child should not be interpreted as sexual behavior.
- There are federal and state laws governing breastfeeding, which every physician should be familiar with. The late Elizabeth Baldwin's website provides information and legal resources for protecting the rights of mothers accused of sexual abuse for extended breastfeeding.<sup>25</sup>

## References

1. DiGirolamo AM, Grummer-Strawn LM, Fein SB. Do perceived attitudes of physicians and hospital staff affect breastfeeding decisions? *Birth*. 2003;30:94-100.
2. Mikiel-Kostyra K, Mazur J, Boltrusko I. Effect of early skin-to-skin contact after delivery on duration of breastfeeding: a prospective cohort study. *Acta Paediatr*. 2002; 91:1301-1306.
3. Dettwyler KA. Beauty and the breast: the cultural context of breastfeeding in the United States. In: Stuart-Macadam P, Dettwyler KA, eds. *Breastfeeding: Biocultural Perspectives*. New York, NY: Aldine de Gruyter; 1995:167-215.
4. Dettwyler KA. A time to wean: the hominid blueprint for the natural age of weaning in modern human populations. In: Stuart-Macadam P, Dettwyler KA, eds. *Breastfeeding: Biocultural Perspectives*. New York, NY: Aldine de Gruyter; 1995:39-73.
5. Dettwyler KA. Evolutionary medicine and breastfeeding: implications for research and pediatric advice. The 1998-99 David Skomp Distinguished Lecture in Anthropology. Department of Anthropology, Indiana University; Bloomington, Indiana; 1998.
6. World Health Organization and UNICEF. *Global Strategy for Infant and Young Child Feeding*. Geneva, Switzerland: World Health Organization. Available at: [http://www.who.int/gb/EB\\_WHA/PDF/EB107/ee3.pdf](http://www.who.int/gb/EB_WHA/PDF/EB107/ee3.pdf) or [http://www.who.int/nut/documents/gs\\_infant\\_feeding\\_text\\_eng.pdf](http://www.who.int/nut/documents/gs_infant_feeding_text_eng.pdf). Accessed April 2, 2004.
7. Work Group on Breastfeeding. American Academy of Pediatrics. Breastfeeding and the use of human milk. *Pediatrics*. 1997; 100:1035-1039. Also available at: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b100/6/1035>. Accessed April 2, 2004.
8. American Academy of Family Physicians. *AAFP Policy Statement on Breastfeeding*. Available at: <http://www.aafp.org/x6633.xml>. Accessed April 2, 2004.
9. American College of Obstetricians and Gynecologists. *Breastfeeding: Maternal and Infant Aspects. Educational Bulletin #258*. 2000. See <http://www.acog.org/> for contact information.
10. U.S. Public Health Service's *Healthy People 2010*. Available at: <http://www.healthypeople.gov>. Accessed April 2, 2004.
11. Harvey PH, Clutton-Brock TH. Life history variation in primates. *Evolution*. 1985;39: 559-581.
12. Charnov EL, Berrigan D. Why do female primates have such long life spans and so few babies? or Life in the slow lane. *Evol Anthropol*. 1993;1:191-194.
13. Lee PC, Majluf P, Gordon IJ. Growth, weaning and maternal investment from a comparative perspective. *J Zoo Soc London*. 1991;225:99-114.
14. Hamill PVV, Drizd TA, Johnson CL, et al. Physical growth: National Center for Health Statistics percentiles. *Am J Clin Nutr*. 1979; 32:607-629.
15. Smith BH. Life history and the evolution of human maturation. *Evol Anthropol*. 1992;1: 134-142.
16. Hahn-Zoric M, Fulconis F, Minoli I, et al. Antibody responses to parenteral and oral vaccines are impaired by conventional and low protein formulas as compared to breastfeeding. *Acta Paediatr*. 1990;79:1137-1142.
17. Pabst HF, Spady DW. Effect of breastfeeding on antibody response to conjugate vaccine. *Lancet*. 1990;336:269-270.
18. de Andraca I, Uauy R. Breastfeeding for optimal mental development: the alpha and the

- omega in human milk. *World Rev Nutr Diet*. 1995;78:1-27.
19. Kendall-Tackett KA, Sugarman M. The social consequences of long-term breastfeeding. *J Hum Lact*. 1995;11:179-183.
20. Sugarman M, Kendall-Tackett KA. Weaning ages in a sample of American women who practice extended breastfeeding. *Clin Pediat (Phila)*. 1995;12:642-647.
21. Piovanetti Y. Breastfeeding beyond 12 months: a historical perspective. *Pediatr Clin North Am*. 2001;48:199-206.
22. Flower H. *Adventures in Tandem Nursing: Breastfeeding During Pregnancy and Beyond*. Schaumburg, IL: La Leche League International; 2003.
23. Ellison PT. *On Fertile Ground: A Natural History of Human Reproduction*. Cambridge, MA: Harvard University Press; 2003.
24. Kippley SK. *Breastfeeding and Natural Child Spacing: How Ecological Breastfeeding Spaces Babies*. Revised ed. Cincinnati, OH: Couple to Couple League; 1999.
25. Baldwin EN. *Breastfeeding and Parenting Issues: Breastfeeding and the Law*. Available at: <http://www.compromisesolutions.com>. Accessed April 2, 2004.