

Breastfeeding

Benefits, Responsibilities for Health Promotion, and
Update on Indian Health Service (IHS) Activities

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IHS Website as Virtual Office/Resource

<http://www.ihs.gov/MedicalPrograms/MCH/M/bf.cfm>

Access to Scientific Literature

Access for Multiple Audience / Users

Consultation / Current Practice Updates

Policy

Lactation Support in the Workplace Policy

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Address <http://www.ihs.gov/MedicalPrograms/MCH/M/bf.cfm> Go Links

Google Go Bookmarks 0 blocked Check AutoLink AutoFill Send to Settings



- > Site Map
- > What's New
- > FAQs
- > UpToDate
- > Nurse Midwives
- > MCH Coordinators

Other Areas of Interest:

- Maternal Child Topics**
- Maternal Child Home
 - Breastfeeding
 - Family Planning
 - Child Health Notes
 - OB/GYN CCC Corner
 - Perinatologist Corner
 - Pregnancy

- Contact Us**
- MCH Website Administrator

Required Plugins

These plug-ins may be required for the content on this page:

Maternal Child

Maternal Child Health > Breastfeeding

Breastfeeding

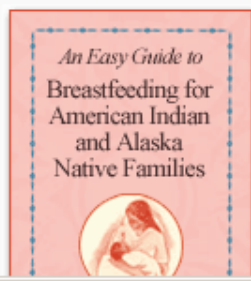
When a mom breastfeeds, she does what no one else can do for her baby's tomorrows.



... and Dads, Families, Communities, Work and School Make it happen.

Websites for Easy Guide to Breastfeeding for American Indian and Alaska Native Families:

- > [Office of Women's Health](#)
 - Look under the Easy Guides or breastfeeding.
- > [Indian Health Services](#)



Breastfeeding

More Information:

- [Breastfeeding Home Page](#)
- [Benefits for Babies, Moms, Families & Communities](#)
- [Going back to school & work](#)
- [Dad's and Family Page](#)
- [Medications & recreational drugs](#)
- [Diabetes & Obesity Relationship to Breastfeeding](#)

Frequently Asked Questions

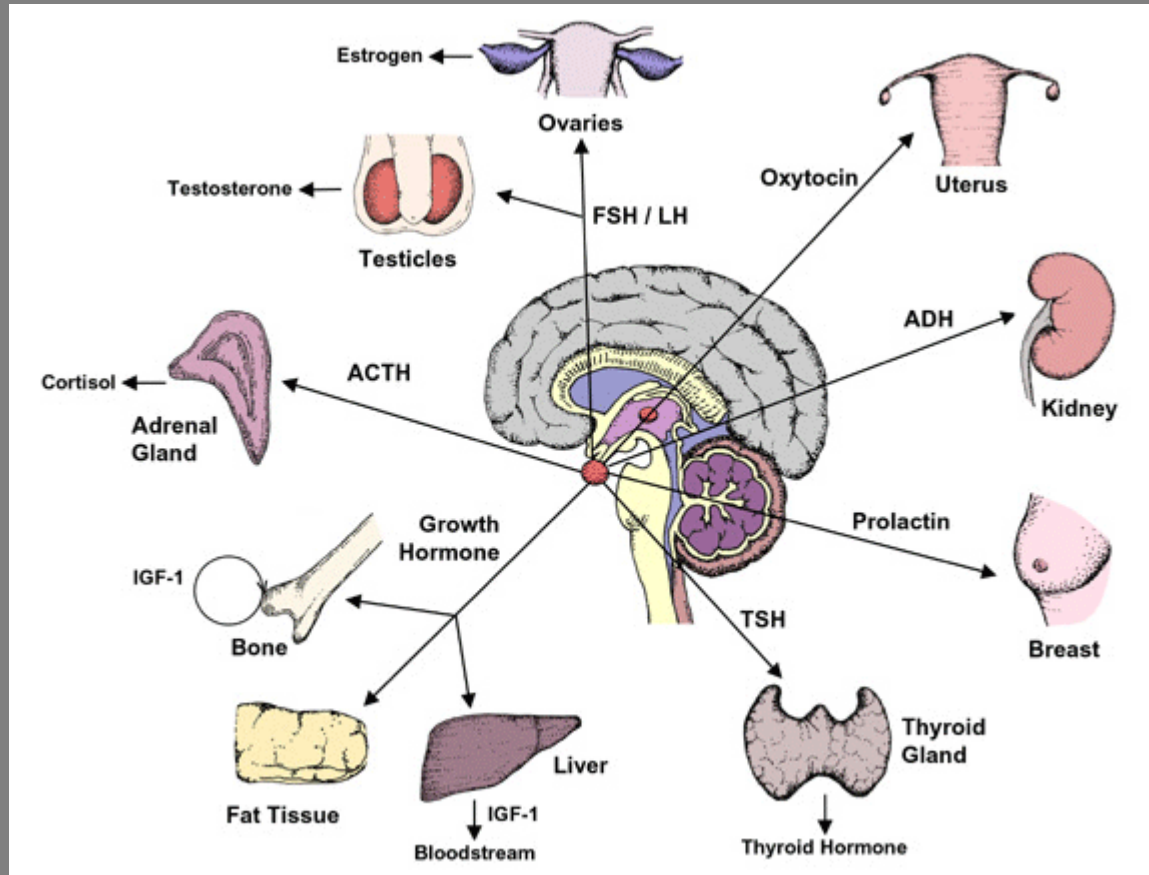
IHS BF Contacts and IHS Best Practice Site Contacts

suzan.murphy@ihs.gov or call 1-877-868-9473
 1-877-868-9473 (1-877-TOTWISE)

[Jenny Chee](#), Chinle Arizona

Anatomy and Physiology Informing Practice





<http://www.ohsupituitary.com/patients/about.asp>

Stages of Lactation

<http://www.emedicine.com/ped/topic2594.htm>

Mammogenesis: Mammary (breast) growth occurs. The size and weight of the breast increase.

Lactogenesis

- Stage 1 (late pregnancy): Alveolar cells are differentiated from secretory cells.
- Stage 2 (day 2 or 3 to day 8 after birth): The tight junction in the alveolar cell closes. Copious milk secretion begins. Breasts are full and warm.

Endocrine control switches to autocrine (supply-demand) control.

Galactopoiesis (later than day 9 after birth to beginning of involution): Established secretion is maintained. Autocrine system control continues.

Involution (average 40 days after last breastfeeding): Regular supplementation is added. Milk secretion decreases from the buildup of inhibiting peptides.

Nerve fibers in the posterior pituitary are 'beset' by specialized astroglial cells called pituicytes.

Oxytocin is stored within nerve terminals of the neural lobe.

Oxytocin and sex hormones and HPA axis responses

- Secreted into the peripheral circulation from magnocellular neurons in the PVN and supraoptic nucleus (SON), the neuropeptide oxytocin plays a major role in reproduction, controlling uterine contractility and milk ejection. In addition, oxytocin released within the brain is responsible for maternal behavior and can modulate behavioral and hormonal responses to stress. Physiological conditions under which oxytocin secretion is high are associated with decreased responsiveness of the HPA axis to stress, and it has been postulated that oxytocin mediates the blunted HPA axis responses to stress during lactation. Given that previous studies in our laboratory showed no inhibitory effect on HPA axis activity of intracerebroventricular (icv) oxytocin in ovariectomized rats receiving low estradiol (E2) replacement, we examined the influence of circulating estradiol on the effects of icv oxytocin infusion on plasma ACTH and corticosterone, as well as on hypothalamic CRH expression responses to restraint stress in ovariectomized rats. We found that oxytocin infusion had little effect on basal or stress-stimulated plasma corticosterone, irrespective of sex hormone levels. In contrast, icv oxytocin blunted ACTH responses to stress. Basal CRH mRNA levels increased with high E2 replacement but decreased with icv oxytocin infusion in high- and low-E2 experiments. CRH mRNA responses to restraint were not significantly different in high- and low-E2 experiments but were suppressed by icv oxytocin only in rats with high estrogen levels. The study shows that the ability of oxytocin to inhibit HPA axis responses to restraint stress in female rats depends on the presence of high E2 levels. The data emphasize the importance of estrogen in the regulation of the HPA axis. These findings may be relevant to the pathogenesis of psychiatric disorders associated with reproduction such as postpartum depression and premenstrual syndrome.
- Ochedalski T, Subburaju S, Wynn P, Aguilera G. Estradiol modulates the effect of central oxytocin on hypothalamic pituitary adrenal axis activity in rats. *J Neuroendocrinol* (in press).

Central actions of prolactin

- In addition to its role in lactation, prolactin (PRL) produced in the brain can act as a neurotransmitter/ neuromodulator, attenuating the HPA axis and behavioral responses to stress. Given that the expression of PRL and PRL receptors in the PVN increases during lactation, PRL has been implicated in the mechanism of the blunted stress responses observed in during lactation. To determine the mechanisms mediating the central effects of PRL, we examined the signaling pathways stimulated in the hypothalamus after icv injection of PRL in male and female rats in vivo and in vitro in the hypothalamic cell line 4B, cells that express endogenous CRH. Western blot analysis of hypothalamic proteins following PRL injection showed phosphorylation of Stat1 at 10 minutes in female rats and at 30 minutes in male rats while pStat3 was elevated in males and females at 30 minutes. Furthermore, central PRL administration induced phosphorylation of MEK (at 5 and 10 minutes) and ERK1/2 in the nucleus (30 minutes) in male and female rats. Immunohistochemical analysis of pERK1/2 in hypothalamic sections 30 minutes after icv PRL revealed staining in the PVN. Western blot analysis of protein extracts from hypothalamic cells 4B with a PRL receptor antibody showed a 40kDa band consistent with the short form of the PRL receptor. Incubation of the cells with PRL caused rapid and progressive increases in pERK1/2. We examined the effects of PRL on CRH expression in 4B cells transfected with a luciferase reporter gene driven by the CRH promoter. Prolonged incubation of the cells with PRL increased basal and potentiated forskolin-stimulated CRH promoter activity. In addition to conventional Stat signaling, the study shows that PRL activates the ERK1/2 MAP kinase cascade in the hypothalamic PVN. The ability of PRL to induce ERK phosphorylation and to increase CRH promoter activity in a CRH-expressing hypothalamic cell line suggests that PRL can directly modulate CRH neuron function.

Human Milk Immunoglobulins, leukocytes

http://www.emedicine.com/ped/topic2594.htm#section-immunologic_properties_of_human_milk

Human milk contains all of the different antibodies (M, A, D, G, E), but secretory immunoglobulin A (sIgA) is the most abundant. Milk-derived sIgA is a significant source of passively acquired immunity for the infant during the weeks before the endogenous production of sIgA occurs. During this time of reduced neonatal gut immune function, the infant has limited defense against ingested pathogens. Therefore, sIgA is an important protective factor against infection.

Vertical passive immunity - Assuming ... shared common flora, the antigenic specificity of the mother's sIgA in her milk is directed against the same antigens in the neonate. Maternal immunoglobulin A (IgA) antibodies derived from the gut and respiratory immune surveillance systems are transported via blood and lymphatic circulations to the mammary gland, ultimately to be extruded into her milk as sIgA. The packaging of IgA with a secretory component unique to the mammary gland protects the sIgA from stomach acids, allowing it to reach the small intestine intact.

human milk has numerous factors that can affect the intestinal microflora of the baby. These factors enhance the colonization of some bacteria while inhibiting the colonization by others. The immunologic components include lactoferrin, which binds to iron, thus making it unavailable to pathogenic bacteria; lysozyme, which enhances sIgA bactericidal activity against gram-negative organisms; oligosaccharides, which intercept bacteria and form harmless compounds that the baby excretes; milk lipids, which damage membranes of enveloped viruses; and mucins, which are present on the milk-fat globule membrane. Mucins adhere to bacteria and viruses and help eliminate them from the body. Interferon and fibronectin have antiviral activities and enhance lytic properties of milk leukocytes.

Macrophages comprise 40-60% of the cells in colostrum, with the remainder of cells consisting primarily of lymphocytes and polymorphonucleocytes. Extruded into the milk are rare mammary epithelial cells and the plasma membrane-bound lipid droplets referred to as milk-fat globules. By 7-10 days postpartum, with the transition from colostrum to mature milk, the percentage of macrophages then increases to 80-90% at a concentration of 104-105 human milk macrophages per milliliter of milk. Milk leukocytes can tolerate extremes in pH, temperature, and osmolality. They have been shown to survive for as long as a week in baboons and lambs.

Passive immunity from mother to recipient breastfeeding infant

While awaiting endogenous maturation of the baby's own immunologic systems, various immunologic and bioactive milk components act synergistically to provide a passive immunologic support system from the mother to her infant in the first days to months after birth. Ingested milk passively immunizes the neonate. Numerous studies have clearly documented this scenario and its clinical benefit, demonstrating decreased risk for gastrointestinal and respiratory infections, particularly during the first year of life.

Evidence is increasing that these immune and bioactive substances prime the neonatal gastrointestinal and immune systems in their selective recognition of antigens and development of cellular signaling. This may explain the decreased risk of intestinal and respiratory allergy in children who have been breastfed and the lower-than-predicted risk of autoimmune diseases in the breastfed population. Direct effects are difficult to prove given the multifactorial nature of such diseases; however, when taken together, the data support the beneficial nature of human milk for the developing infant.

Benefits

Mom

Faster recovery. Oxytocin – Hypothalamic Pituitary Axis

Feelings of well-being. Again attributable to HPA - oxytocin

Higher self-esteem. Breastfeeding can be an empowering experience for women. Your self esteem likely will increase when you realize that you are doing something for your baby that no one else can do. This may give you more positive self-talk that can help you get through the challenging days and nights of caring for a baby.

Faster postpartum weight loss. While breastfeeding, your body uses lots of energy and you will return to your pre-pregnancy size more rapidly. You can worry less about consuming calories and fat at this time. Energy

Lower rate of cancer. Among women who breastfeed, there is a lower incidence of certain cancers: breast, uterine, ovarian and endometrial. This is an important benefit, especially if there is a history of these cancers in your family. The longer you nurse, the better the protection. This is related to lower levels of estrogen in your body at this time.

Less insulin. If you need insulin to control diabetes, you will require less insulin postpartum.

Lower cost. Breastfeeding costs less than formula-feeding, as you will not need to buy formula and you will need only a few bottles and nipples (for those times when you can't nurse your baby). The yearly cost of using ready-made formula is about \$4,000 a year, not including accessories such as bottles. The cost of using powder formula is about \$1,500 per year. If you return to work while still breastfeeding your infant, you will miss fewer days of work because your baby will be sick less often. This is because of the infection-fighting quality of the breast milk.

Lower risk of osteoporosis. Studies have shown that breastfeeding increases bone density, therefore reducing the risk of osteoporosis in older women.

Infant

Lower risk of infections and medical conditions. The infant who is breastfed may be at less risk of the following infections and diseases: diarrhea; influenza; ear infections; respiratory infections, including respiratory syncytial virus (bronchiolitis); asthma; allergy; eczema; herpes simplex; sudden infant death syndrome (SIDS); obesity; AIDS; multiple sclerosis; inguinal hernia; undescended testicle; reflux or gastroesophageal reflux disease; diabetes; oral malocclusion; childhood cancers; Crohn's disease; Hodgkin's disease; urinary-tract infections; and juvenile rheumatoid arthritis.

Better vaccine protection. Breastfed infants have a higher vaccine response to the immunizations that they are given. They develop higher antibody levels to protect against these infections.

Higher intelligence. Components of breast milk encourage optimal brain development. (species specific – myelination)

Better oral development. Breastfeeding enhances your baby's jaw and oral development. (see videos of latch at the mch web site)

Higher oxygenation and temperature. Breastfed babies maintain higher levels of oxygenation and warmer body temperature while feeding than do bottle-fed infants. The baby is in control of the flow of milk when breastfeeding so he does not have to struggle to keep his airway open, as might happen when milk flows freely from a bottle and fills up the mouth. Easier breathing means more oxygen gets into the blood, which enhances development. When you breastfeed, your baby is next to or on your warm body, helping him to stay warm. This is especially important in the early time of the baby's life when he has difficulty maintaining his temperature.

Baby-led feeding. A breastfed baby is controlling the feeding and tends to feed when he wants and for as long as he wants. This helps to maintain your milk supply. In response to stimulation of the breasts, hormones are released that tell the breasts to make milk. If the baby asks for more, your body will make more. Self-control of feeding also may help to establish better eating habits later in life.



Long-term and Population Level Benefits

4.5 by 2010 Infant mortality

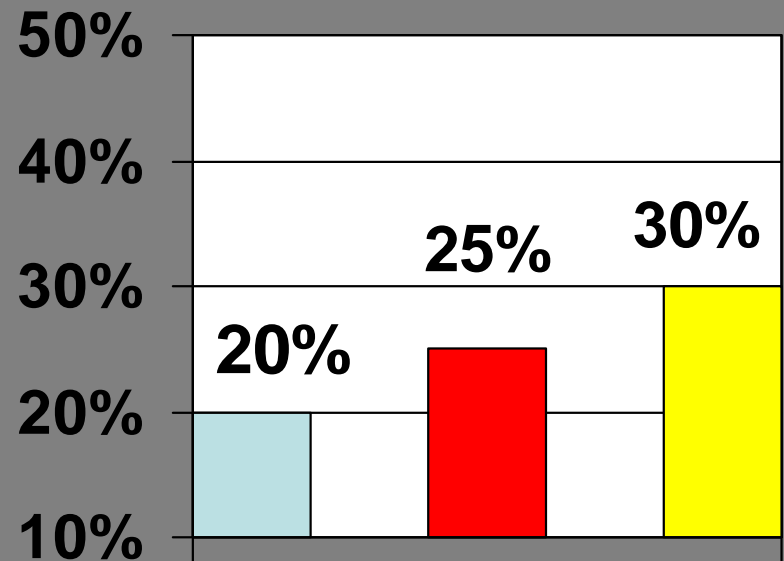
Childhood obesity 5 % by 2010

Risk of diabetes - ...% by 2015

Breastfeeding and the Reduced Risk of Diabetes

Prevalence of Diabetes

Among Pima Indians being BF ≥ 2 months related to less risk for developing diabetes by 40 years of age (Pettitt, 1998)



- BF 2 months or longer
- Some BF
- Never BF

exclusivity ... Duration
... promotion
... initiation...
protection
support

US Preventive Task Force

<http://www.ahrq.gov/clinic/uspstf/uspsbrfd.htm>

July 2003

- **Summary of Recommendations**
- **The U.S. Preventive Services Task Force (USPSTF) recommends structured breastfeeding education and behavioral counseling programs to promote breastfeeding. Rating: **B Recommendation****
- *Rationale:* The USPSTF found fair evidence that programs combining breastfeeding education with behaviorally-oriented counseling are associated with increased rates of breastfeeding initiation and its continuation for up to 3 months, although effects beyond 3 months are uncertain. Effective programs generally involved at least 1 extended session, followed structured protocols, and included practical, behavioral skills training and problem-solving in addition to didactic instruction.
- The USPSTF found fair evidence that providing ongoing support for patients, through in-person visits or telephone contacts with providers or counselors, increased the proportion of women continuing breastfeeding for up to 6 months. Such support, however, had a much smaller effect than educational programs on the initiation of breastfeeding and its continuation for up to 3 months. Too few studies have been conducted to determine whether the combination of education and support is more effective than education alone.
- **The USPSTF found insufficient evidence to recommend for or against the following interventions to promote breastfeeding: brief education and counseling by primary care providers; peer counseling used alone and initiated in the clinical setting; and written materials, used alone or in combination with other interventions. Rating: **I recommendation**** *Rationale:* The USPSTF found no evidence for the effectiveness of counseling by primary care providers during routine visits and generally poor evidence to assess the effectiveness of peer counseling initiated from the clinical setting when used alone to promote breastfeeding in industrialized countries. The evidence for the effectiveness of written materials suggests no significant benefit when written materials are used alone and mixed evidence of incremental benefit when written materials are used in combination with other interventions.

Provider and Institutional Responsibilities

- Promote and support breastfeeding enthusiastically...a strong position on behalf of breastfeeding is justified.
- Become knowledgeable and skilled in both the physiology and the clinical management of breastfeeding.
- Work collaboratively ...throughout the perinatal period to make a fully ...informed decision about infant feeding.
- Promote hospital policies and procedures that facilitate breastfeeding. Electric breast pumps and private lactation areas...work actively toward eliminating hospital practices that discourage breastfeeding (e.g., infant formula discharge packs and separation of mother and infant).
- Become familiar with local breastfeeding resources
- ... coverage for ... services and supplies...time required by pediatricians and other licensed health care professionals to assess and manage breastfeeding.
- Promote breastfeeding as a **normal part of daily life**, and encourage family and societal support for breastfeeding.
- Safety to “...ensure optimal breastfeeding education, support, and counsel for mother and infant.”
- mothers...breast examination when breastfeeding is terminated.
- media to portray breastfeeding as positive and the norm.
- Encourage employers to provide appropriate facilities and adequate time in the workplace for breast-pumping.

