

Breastfeeding Benefits: Claim or Over Claim



BREASTFEEDING & MATERNAL HEALTH



พ.อ.หญิง ผศ.ปริศนา พานิชกุล
กองสูตินรีเวชกรรม รพ.พระมงกุฎเกล้า



Breastfeeding & Maternal Health



NO CONFLICT OF INTEREST



Breastfeeding & Maternal Health



SCOPE of TODAY

- **Maternal brain health**
- **Lactational amenorrhea**
- **Maternal bone health**
- **Cancer risk**
- **Metabolic & Cardiovascular risk**



BF & Maternal Health



Table 1. Health Risks for Mothers Who Do Not Breastfeed

Breast cancer	Myocardial infarction
Diabetes mellitus	Obesity
Hyperlipidemia	Ovarian cancer
Hypertension	

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BF & Maternal Health: Maternal BRAIN



- **During pregnancy & lactation:**

- Numerous changes on the physiological, cellular, and molecular level occur



- distinguish lactating mother from nulliparous female
 - prepare the female for the challenges of motherhood



BF & Maternal Health: Maternal BRAIN




- Those dramatic changes in maternal physiology, ***plasticity of maternal brain***, & maternal behavior
 - Help to ensure survival of the offspring
 - Act in concert for physiological & mental health of the mother

Hillerer KM, Jacobs VR, Fischer T, Aigner L. The maternal brain: an organ with peripartal plasticity. Neural Plasticity 2014, Article ID 574159. Available from: <http://dx.doi.org/10.1155/2014/574159>



BF & Maternal Health: Maternal BRAIN

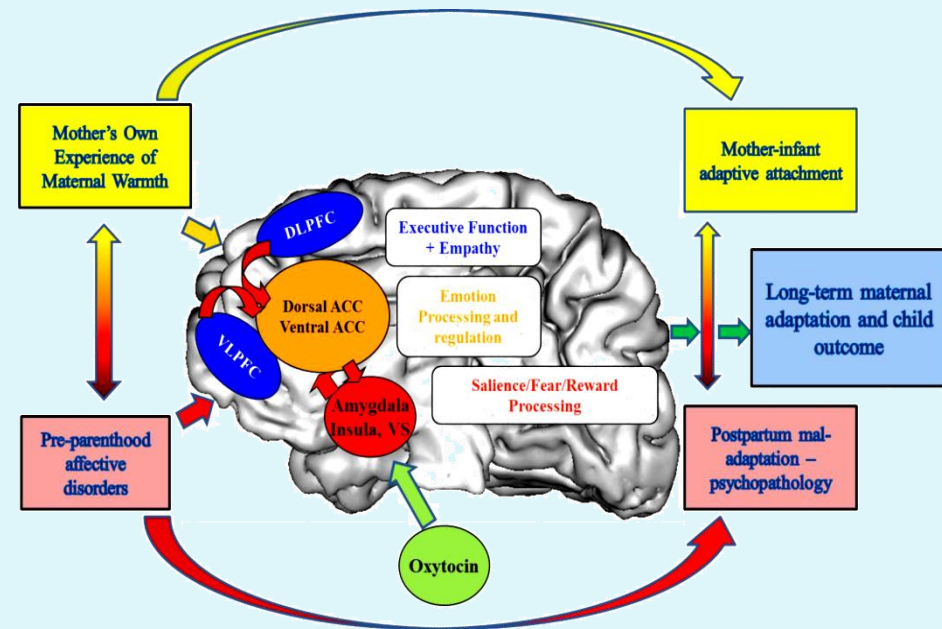


- **Maternal brain regions changes**
 - Particularly affected by peripartum-associated modifications - can be summarized as ***“maternal circuitry”***

 - Some of these brain regions -crucial for onset, maintenance, & regulation of maternal behavior

BF & Maternal Health: Maternal BRAIN

• Anatomical changes

- Several brain regions involved in maternal motivation and reward processing, & in processing sensory information and empathy exhibited structural growth
- Regions associated with regulating emotions, showed structural ↑
- No neural regions showed reduction in grey matter during this time period





BF & Maternal Health: Maternal BRAIN

**Maternal Prolactin
from pituitary**
(feed-back to the
maternal brain)

**Placental
Lactogen**
(acts on
maternal brain)



**Adaptation in
maternal brain**

**Maternal adaptations
for pregnancy**

Preparation for

- Development of breast

Coping with fe

- Fluid retention
- Cardiovascular and
- Altered glucose met
- Altered immune syst

Providing support to the fetus

- Uterine growth
- Development of the placenta*

* Established link to
Prolactin or Placental
Lactogen

Maternal Behavior

- ❖ Maternal behavior
- ❖ Adult neurogenesis
- ❖ Reduced anxiety
- ❖ Increased aggression to protect young

- Increased appetite and fat deposition*
- Loss of menstrual cycle*

Preventing fetal programming

- Reduced fever response
- Suppressed stress responses*



Grattan D. A Mother's Brain Knows. In: Neuro-endocrinology, briefing.

[J Neuroendocrinol.](https://doi.org/10.1111/j.1365-2826.2011.02175.x) 2011;23(11):1188-9. doi: 10.1111/j.1365-2826.2011.02175.x.



BF & Maternal Health: Maternal BRAIN



Prolactin

- Stimulate onset of maternal behavior after birth
- Stimulate neurogenesis in maternal brain
- → may promote appropriate changes in mood & maternal behavior

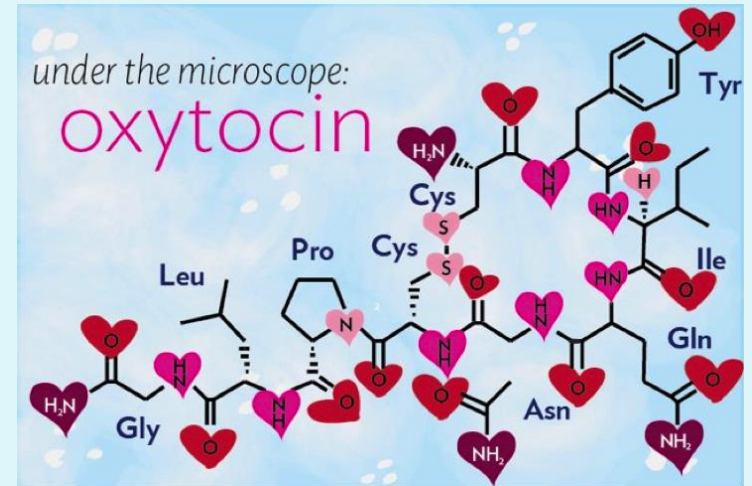
BF & Maternal Health: Maternal BRAIN

Oxytocin

- **Behavioral effects**

- Suppress appetite
- Stimulate grooming behavior
- Affiliative behavior: promote maternal bonding

- Oxytocin functions = directly associated with mother's ability to provide optimal caregiving





BF & Maternal Health: Maternal BRAIN





BF & Maternal Health: Maternal BRAIN



Empowerment

- BF women change their behavior
 - Develop self-esteem & assertiveness
 - Interact more maturely with their infants



Lila. Illustration for www.londondominus.com/uk/



BF & Maternal Health: LAM

Natural contraceptive effect of lactation

- Lactational Amenorrhea Method (LAM)

Fertile state

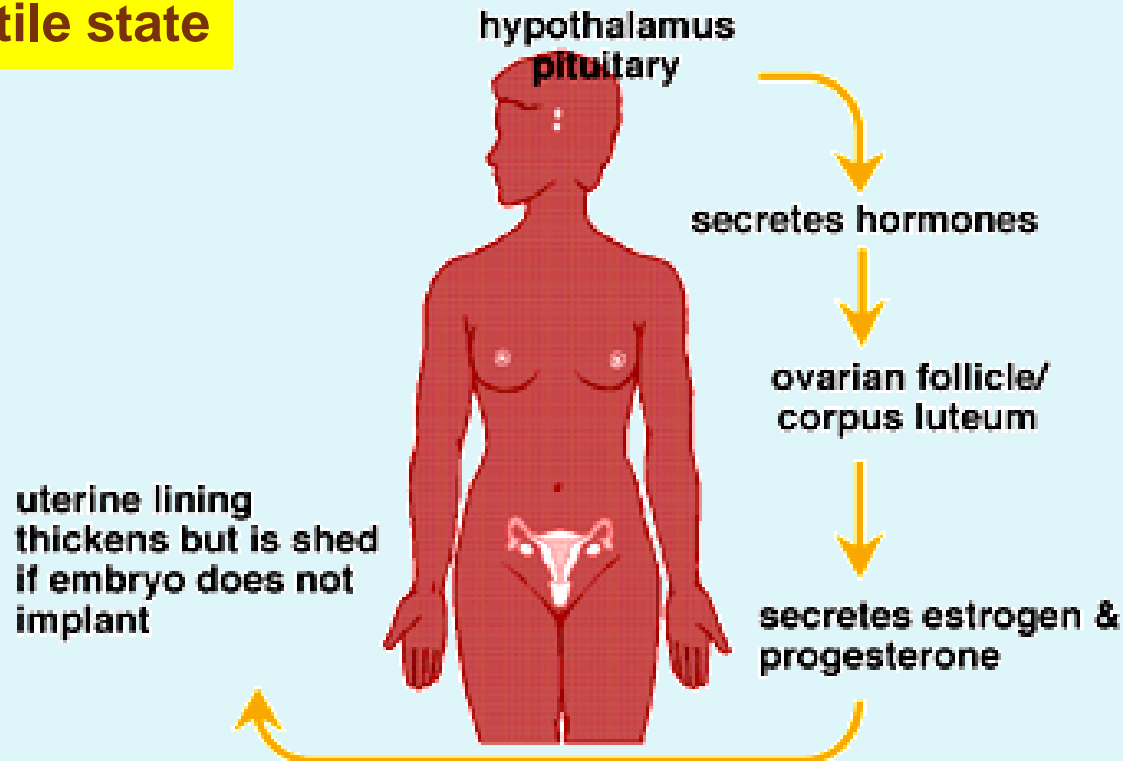


Illustration from: <https://www.fhi360.org/sites/default/files/webpages/Modules/LAM/goals.htm>



BF & Maternal Health: LAM



Natural contraceptive effect of lactation

- Lactational Amenorrhea Method (LAM)

Nonfertile state

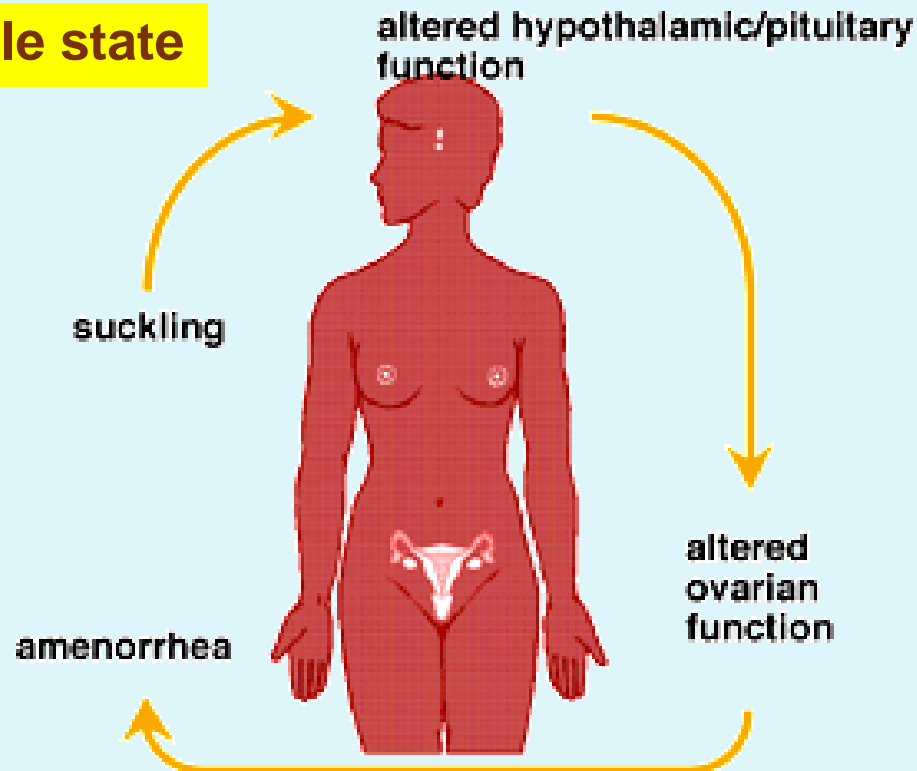


Illustration from: <https://www.fhi360.org/sites/default/files/webpages/Modules/LAM/goals.htm>



BF & Maternal Health: LAM



Lactational Amenorrhea Method (LAM)

- criteria are:
 1. **Lactation**: woman must fully or nearly fully breastfeed, **and**
 2. **Amenorrhea** : breastfeeding woman must be without menses since delivery, **and**
 3. **Months**: infant must be <6 months old



BF & Maternal Health: LAM



Lactational Amenorrhea Method (LAM)

- *Interval between feedings:*

SHOULD NOT > 4-hr during the day or 6-hr @ night

- *Supplemental feedings:*

SHOULD NOT > 5-10% of the total



BF & Maternal Health: LAM



Lactational Amenorrhea Method (LAM)

- ACOG (special report 2007) – most appropriate for women who plan to BF exclusively for 6 months
- Efficacy: 6-month pregnancy rate averaging 1-2%
 - acceptable, learnable, user-friendly, & as effective as many other alternatives (levels of evidence II-2)
 - Cochrane literature review (2015)
 - fertility rates = low among fully BF, amenorrhic ♀



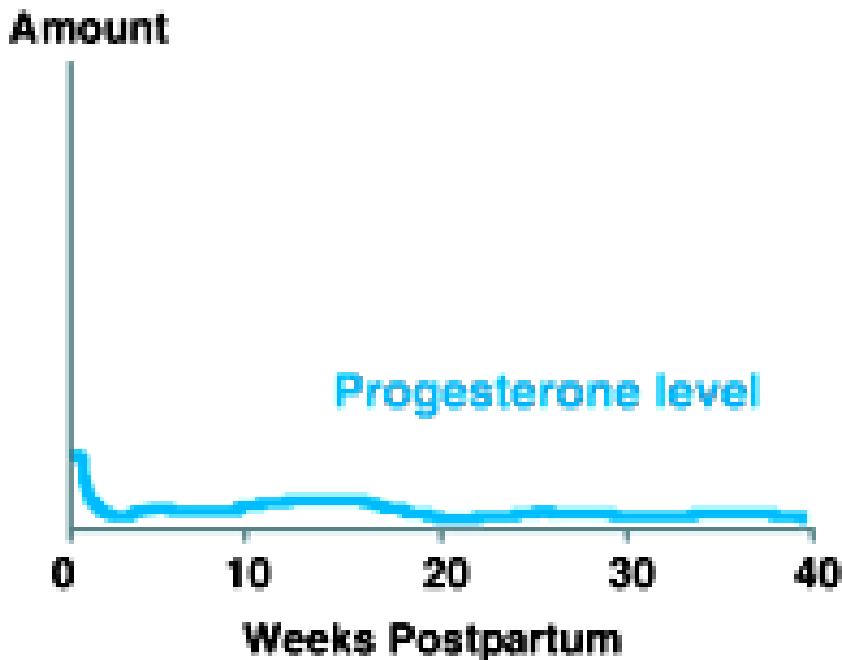
BF & Maternal Health: LAM



- **Effects of Breastfeeding on Ovarian Activity**

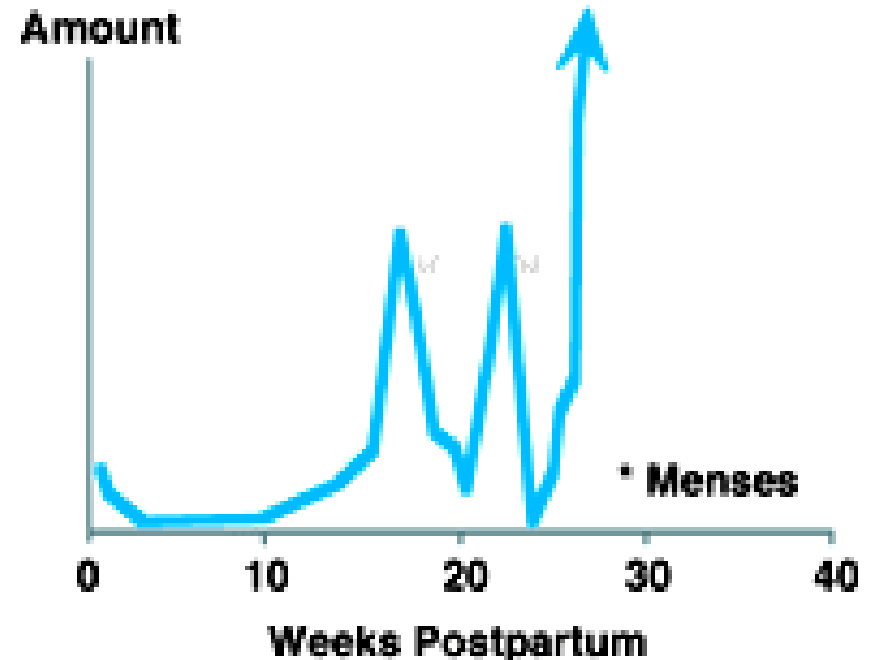
Effective Protection

Intensive Breastfeeding



Ineffective Protection

Infrequent Breastfeeding





BF & Maternal Health: LAM



- **Bellagio Consensus**

“A postpartum woman has at least 98% protection from pregnancy for 6 months when she remains amenorrhic and fully or nearly fully breastfeeds.”

An international panel of experts
met in Bellagio, Italy
August 1988



BF & Maternal Health: LAM

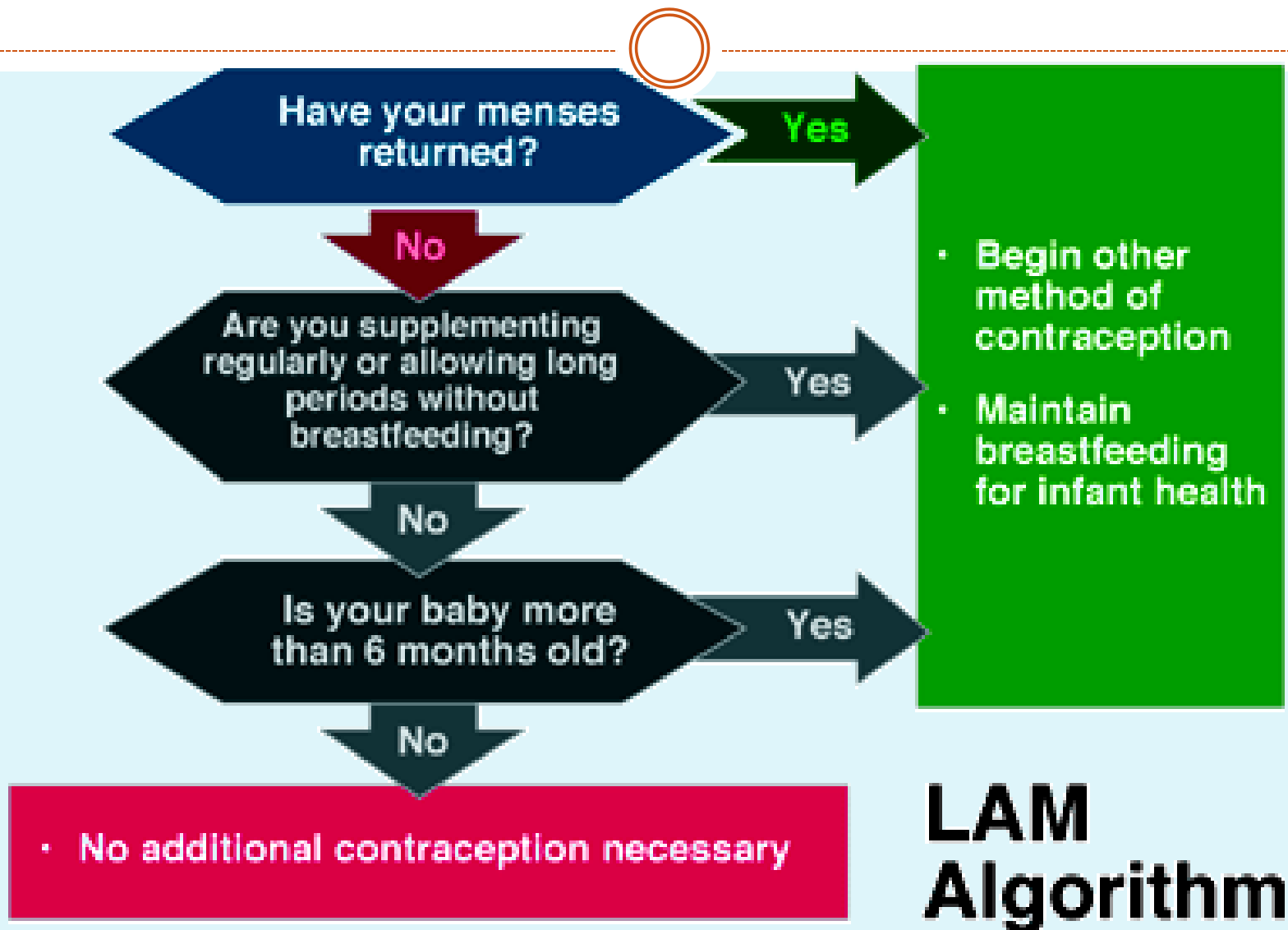


- **LAM Disadvantages**

- Breastfeeding pattern may be difficult to maintain
- No STD or HIV protection
- Duration of method limited
- Only useful for breastfeeding women



BF & Maternal Health: LAM





BF & Maternal Health: BONE



- **Osteoporosis risk in later life of women**

**Never borne
infant women**



**Borne infant
women**



**Borne & breastfed
Infant women**





BF & Maternal Health: BONE



- Bone mineral loss experienced during pregnancy & lactation = TEMPORARY
- Bone mineral density return to normal after pregnancy and even after extended lactation when mineral density are exceed original baseline



BF & Maternal Health: BONE



- **Maternal bone health**
 - Calcium metabolism & bone metabolism = substantially altered with \uparrow calcium demands during lactation
 - High calcium demand during lactation makes ♀ more prone to bone resorption & subsequent osteoporosis
 - Bone densities can \downarrow by between 3-10% in the span of a few months in healthy mother



BF & Maternal Health: BONE



- Pregnancy & lactation - proposed as 2 risk factors for postmenopausal osteoporosis
- Although hormonal changes cause calcium loss & result in \uparrow bone resorption, bone resorption may be reversed after delivery

Salari P, Abdollahi M, Pharm D. The Influence of Pregnancy and Lactation on Maternal Bone Health: A Systematic Review. *Journal of Family and Reproductive Health* 2014; 8(4):135-48.



BF & Maternal Health: BONE



- **There did not appear to be a significant effect of breastfeeding on the risk of osteoporosis.**



BF & Maternal Health: BONE



The Influence of Pregnancy and Lactation on Maternal Bone Health: A Systematic Review

Pooneh Salari; M.D.¹, Mohammad Abdollahi; Pharm D; Ph.D.^{2,3,4}

1 Medical Ethics and History of Medicine Research Center, Tehran University of Medical Sciences, Tehran, Iran

2 Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran

3 Pharmaceutical Sciences Research Center, Tehran University of Medical Sciences, Tehran, Iran

4 Endocrinology & Metabolism Research Center, Tehran University of Medical Sciences, Tehran, Iran

Received July 2014; Revised and accepted July 2014



BF & Maternal Health: BONE



- Numerous studies have investigated on the issue but there is **no consensus about the contributory effect of pregnancy & lactation on osteoporosis.**
- The review shows that despite of controversial results, **pregnancy may have protective effect on bone especially if followed by lactation.**



BF & Maternal Health: Breast cancer

- **Breast cancer**

- Breast cancer = more common among non-BF mothers
- Meta-analysis of 47 studies - for each year a mother BF, her risk of invasive breast cancer is ↓ by >4%



Schwarz EB, Nothnagle M. The Maternal Health Benefits of Breastfeeding.
www.aafp.org/2015/0501/p602.pdf



BF & Maternal Health: Breast cancer



Food, Nutrition, Physical Activity, And Cancer of The Breast (Premenopause)

STRENGTH OF CURRENT EVIDENCE	DECREASES RISK	INCREASES RISK
CONVINCING Effect on Risk:		Adult attained height
PROBABLE Effect on Risk:	Vigorous physical activity Lactation	Alcoholic drinks Greater birthweight

Source: AICR/WCRF Diet, nutrition, physical activity and breast cancer, 2017



BF & Maternal Health: Breast cancer



Food, Nutrition, Physical Activity, And Cancer of The Breast (Postmenopause)

STRENGTH OF CURRENT EVIDENCE	DECREASES RISK	INCREASES RISK
CONVINCING Effect on Risk:		Body fatness Alcoholic Drinks Adult weight gain Adult attained height
PROBABLE Effect on Risk:	Physical activity Lactation Body fatness as young adult	

Source: *AICR/WCRF Diet, nutrition, physical activity and breast cancer, 2017*



BF & Maternal Health: Breast cancer



- The risk reduction for breast carcinoma = 8% among ever BF mothers when finely adjusted for parity
- Longer duration of BF (>12 months) - associated with more protection of breast carcinoma than shorter duration of BF (<6 and 6–12 months) when compared to never BF



BF & Maternal Health: Breast cancer



- **Possible biological protection mechanisms:**
 - May occur through parity-specific changes in levels of circulating hormones (estradiol, prolactin & growth hormone) = associated with breast cancer risk
 - Parous mammary gland may contain epithelial cells with more differentiated & less proliferative character which = less susceptible to transformation
 - Shedding of breast tissue after lactation may also help rid cells with DNA damage



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RECOMMENDATION ON

BREASTFEEDING

It is best for mothers to
breastfeed exclusively for
up to 6 months.



Breastfeeding can help
protect mothers from breast
cancer and babies from
excess weight gain, lowering
their cancer risk as adults.

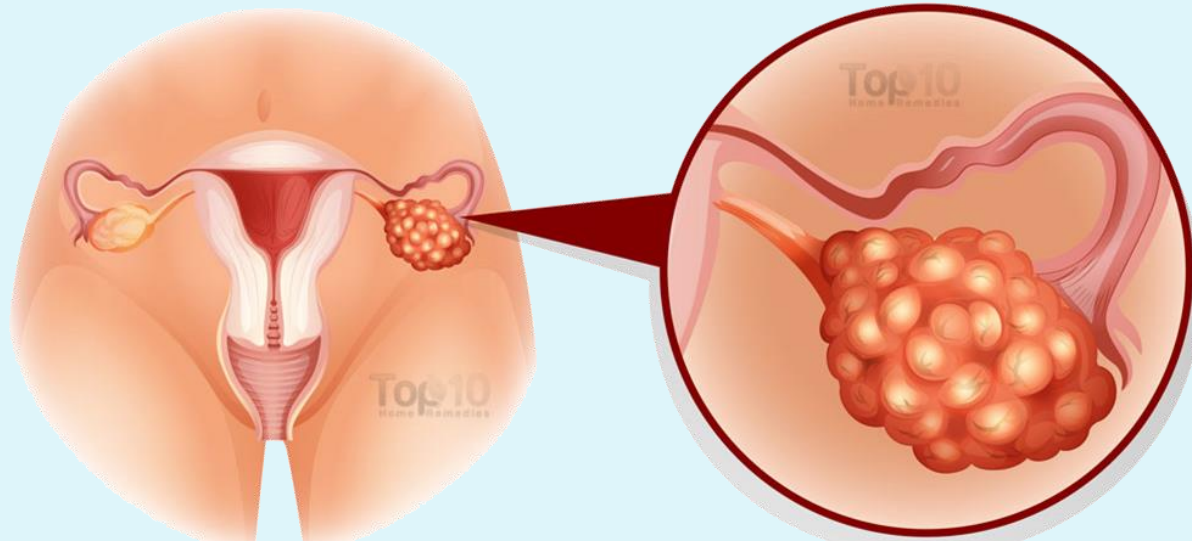




BF & Maternal Health: Ovarian cancer



- **Ovarian cancer**
 - Also more common among mothers who do not BF
 - Meta-analysis of 5 prospective cohort studies & 30 case-control studies, never BF mothers = 32% more likely to develop ovarian cancer





BF & Maternal Health: Ovarian cancer



- BF women for >12 months
= associated with
35% ↓ in ovarian cancer
(compared with women who not BF)



BF & Maternal Health: Ovarian cancer



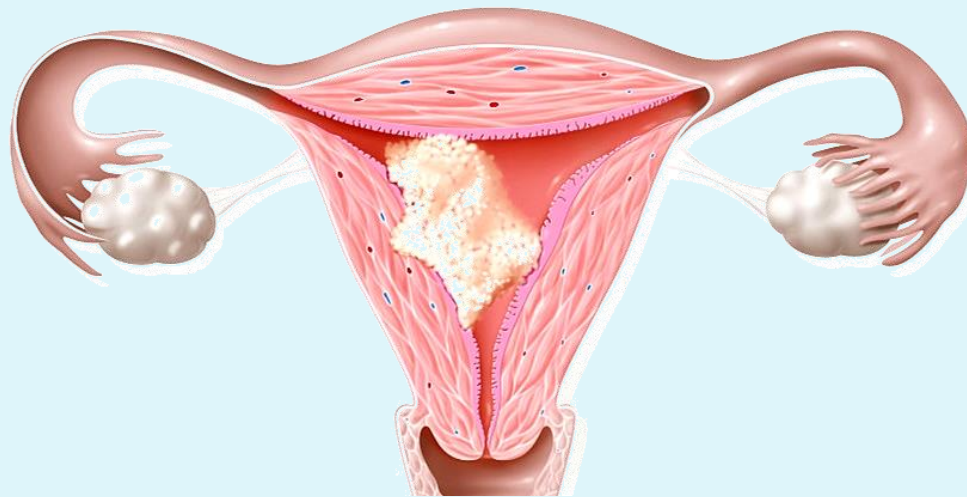
- **Physiological protective effect mechanisms:**
 - May account for BF against ovarian cancer through modulating ovarian cycle length
 - Longer duration of BF suppresses ovulation longer & causes suppression of gonadotropins, resulting in depressed production of plasma estradiol
-
- Possibly less ovulation when pregnancy or BF



BF & Maternal Health: Endometrial cancer



- Ever BF - associated with 11% ↓ in risk of endometrial cancer
- Longer average duration of BF per child - associated with lower risk of endometrial cancer





BF & Maternal Health: Endometriosis



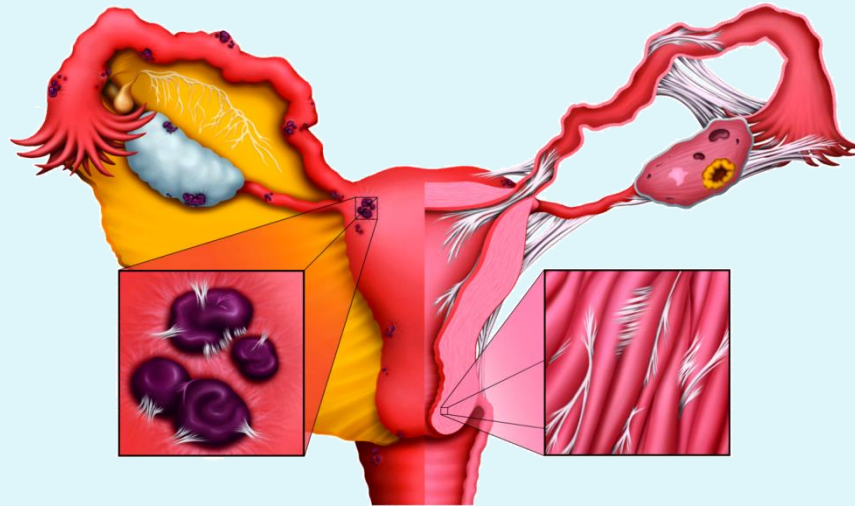
- Duration of total and exclusive BF
 - significantly associated with ↓ risk of endometriosis
- For every additional 3 months of total BF per pregnancy, ♀ experienced 8% lower risk of endometriosis & 14% lower risk for every additional 3 months of EBF per pregnancy
- BF women for ≥ 36 months in total across reproductive lifetime had 40% ↓ risk of endometriosis compared with women who never BF



BF & Maternal Health: Endometriosis



- The protective association with BF was strongest among women who gave birth within the past 5 years
- Association with total BF & exclusive BF on endometriosis - partially influenced by postpartum amenorrhea



History of breast feeding and risk of incident endometriosis: prospective cohort study.
BMJ. 2017; 358: j3778. Published online 2017 Aug 29.



BF & Maternal Health: Long-term metabolic Health



- **Maternal long term metabolic health**
 - Milk production, requires ≈ 500 kcal/day for EBF infant,
↓ maternal obesity in later life
 - ↓maternal risk of DM & hyperlipidemia
 - Longer duration of BF - ↓ risk of development of DM type 2 by 32%, and in linear dose–response analyses, there was 9% reduction in relative risk for each 12- month
↑ in lifetime duration of BF



BF & Maternal Health: Long-term metabolic Health



- **Potential mechanisms:**

- Lactation may*

- "reset" maternal metabolism after pregnancy
 - improve beta cell function
 - suppress HPA-axis activity through action of oxytocin and other lactogenic hormones
 - be a marker for other maternal health behaviors



BF & Maternal Health: Cardiovascular disease



- **Cardiovascular risk**

- Compared with parous never BF ♀, ever BF ♀ = associated with significant lower risk of CVD (coronary HD, stroke)
- BF ♀ \geq 24 months - 18% lower risk of coronary HD & 17% lower risk of stroke (compared with never BF ♀)
- BF = associated with 10% lower risk of several major CVDs in later life

Breastfeeding & the risk of maternal CVD: a prospective study of 300,000 Chinese women.
J Am Heart Assoc. 2017;6:e006081



BF & Maternal Health: Cardiovascular disease



- **Hypertension & Cardiovascular risk**

- ♀ never BF - 29% more likely to develop hypertension, even after adjustment for lifestyle factors & family history
- Women's Health Initiative
 - ♀ who BF for 7-12 months after their 1st delivery
 - 28% less likely to develop cardiovascular disease than mothers who never BF



BF & Maternal Health: *TAKE HOME MESSAGE*



- **Benefits during lactation**
 - Postpartum recovery
 - ✦ Uterine involution
 - ✦ Reduce maternal response to stress
 - ✦ Weight loss
 - ✦ Prolongation of postpartum anovulation - LAM



BF & Maternal Health: *TAKE HOME MESSAGE*

- **Long-term benefit**
 - Reduce risk of
 - ✦ Breast cancer
 - ✦ Ovarian cancer
 - ✦ Endometrial cancer
 - ✦ Endometriosis
 - ✦ Diabetes mellitus
 - ✦ Cardiovascular disease
 - Osteoporosis – unclear





BF & Maternal Health:

TAKE HOME MESSAGE



- **Economic benefit**

- Familial benefit

- ✦ Saving accrued

- NOT buying formula (\$1,000 per year)

- ↓ out-of-pocket expenditures for medical care &
↓ work absences

- Social benefit- economic savings & ↓ mortality



BF & Maternal Health

ACTA PÆDIATRICA
NURTURING THE CHILD

Acta Pædiatrica ISSN 0803-5253

REVIEW ARTICLE

Breastfeeding and maternal health outcomes: a systematic review and meta-analysis

Ranadip Chowdhury (ranadip.chowdhury@sas.org.in)¹, Bireswar Sinha¹, Mari Jeeva Sankar², Sunita Taneja¹, Nita Bhandari¹, Nigel Rollins³, Rajiv Bahl³, Jose Martinez⁴

1. Centre for Health Research and Development, Society for Applied Studies, New Delhi, India

2. Newborn Health Knowledge Centre, ICMR Centre for Advanced Research in Newborn Health, Department of Paediatrics, All India Institute of Medical Sciences, New Delhi, India

3. Department of Maternal, Newborn, Child and Adolescent Health, World Health Organization, Geneva, Switzerland

4. Centre for Intervention Science in Maternal and Child Health, Centre for International Health, University of Bergen, Bergen, Norway

Keywords

Breastfeeding, Long and Short Term, Maternal health, Meta-analysis

Correspondence

Dr Ranadip Chowdhury, Scientist, Centre for Health Research and Development, Society for Applied Studies, 45, Kalu Sarai, New Delhi-110016, India.

Tel: +91 011 46043751- 55 |

Fax: +91 011 46043756 |

Email: ranadip.chowdhury@sas.org.in

ABSTRACT

Aim: To evaluate the effect of breastfeeding on long-term (breast carcinoma, ovarian carcinoma, osteoporosis and type 2 diabetes mellitus) and short-term (lactational amenorrhoea, postpartum depression, postpartum weight change) maternal health outcomes.

Methods: A systematic literature search was conducted in PubMed, Cochrane Library and CABI databases. Outcome estimates of odds ratios or relative risks or standardised mean differences were pooled. In cases of heterogeneity, subgroup analysis and meta-regression were explored.



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Results: Breastfeeding >12 months was associated with reduced risk of breast and ovarian carcinoma by 26% and 37%, respectively. No conclusive evidence of an association between breastfeeding and bone mineral density was found. Breastfeeding was associated with 32% lower risk of type 2 diabetes. Exclusive breastfeeding and predominant breastfeeding were associated with longer duration of amenorrhoea. Shorter duration of breastfeeding was associated with higher risk of postpartum depression. Evidence suggesting an association of breastfeeding with postpartum weight change was lacking.

Conclusion: This review supports the hypothesis that breastfeeding is protective against breast and ovarian carcinoma, and exclusive breastfeeding and predominant breastfeeding increase the duration of lactational amenorrhoea. There is evidence that breastfeeding reduces the risk of type 2 diabetes. However, an association between breastfeeding and bone mineral density or maternal depression or postpartum weight change was not evident.



THANK YOU