

**EVIDENCE-BASED BENEFITS OF BREASTFEEDING FOR  
THE BREASTFEEDING COMMITTEE FOR CANADA:  
A SELECTED ANNOTATED BIBLIOGRAPHY**

Perle Feldman, MDCM CCFP FCFP  
Francesca Frati, MLIS  
McGill University

COMMENTS	RESEARCH	REFERENCES
<b>EFFECT OF BFHI IN IMPROVING BREASTFEEDING RATES IN INDUSTRIALISED COUNTRIES</b>		
<p><b>Evidence shows the benefits of breastfeeding in, Belarus, an industrialized country.</b> <i>This trial demonstrates that it is possible to improve breastfeeding rates using Baby-Friendly Hospital Initiative (BFHI) intervention.</i></p>	<p>A cluster randomisation of maternity hospitals in Belarus (1996-1997) showed that those hospitals receiving intervention following Baby-Friendly Hospital guidelines had increased duration and degree of breastfeeding. Infants born in those hospitals were significantly more likely to be breastfed at 12 months (19.7% vs. 11.4%) more likely to be exclusively breastfed at 3 months (43.3% vs. 6.4%, p. less than 0.001) and at six months (7.9% vs. 0.6%, p = 0.01)</p>	<p>Kramer, M.S., Chalmers, B. &amp; Hodnett, H.D. et al. (2001). <b>A randomized trial in the Republic of Belarus Promotion of Breastfeeding Intervention Trial (PROBIT) [electronic version].</b> <i>JAMA</i> 285, 413-20.</p>
<p><b>Exclusive breastfeeding rates higher in Baby-Friendly hospitals</b> <i>This effect of achieving Baby-Friendly Hospital status persisted after adjustment for maternal age, social deprivation, hospital size, and year of birth.</i></p>	<p>This observational study of all maternity units in Scotland demonstrated that babies born in those units that had been awarded Baby-Friendly status were 28% (p &gt; 0.001) more likely to be exclusively breastfed at 7 days postnatal age than those born in units either in process of becoming Baby-Friendly or those with no initiative in place.</p>	<p>Broadfoot, M., Britten, J. &amp; Tappin, D.M. et al (2003). <b>The Baby Friendly Hospital Initiative and breast feeding rates in Scotland [electronic version].</b> <i>Arch. Dis. Child. Fetal Neonatal Ed.</i> 90, 114-16.</p>

**EFFECT OF BFHI IN IMPROVING BREASTFEEDING RATES  
IN INDUSTRIALISED COUNTRIES CONT.**

**Baby-Friendly hospitals show higher than average breastfeeding rates.**

*Baby-Friendly status improved breastfeeding rates even if background rate was particularly high or low.*

Analysis of 29 Baby-Friendly hospitals in the US showed the following results: 28 hospitals had initiation rates of 83.8 percent compared with US breastfeeding initiation rate of 69.5 percent in 2001. Exclusive in-hospital breastfeeding at 16 hospitals was 78.4 percent compared with national mean of 46.3 percent. In every state, Baby-Friendly hospitals had breastfeeding rates above the state mean and breastfeeding rates were not associated with number of births per institution or with number of black or low income patients.

Merewood, A., Mehta, S.D., & Chamberlain, L.B. et al. (Sep. 2004). **Breastfeeding rates in US Baby-Friendly hospitals: results of a national survey [electronic version]**. *Pediatrics* 116(3), 628-634.

## BREASTFED CHILDREN: PREVENTION OF CHRONIC DISEASE

<p><sup>1</sup><b>Reduced risk of cardiovascular disease</b>  <i>Cardiovascular disease is the leading cause of death of over one-third of Canadians. About 26 percent of men and women are reported to have high blood pressure</i></p>	<p>Breastmilk consumption in children born prematurely was associated with lower blood pressure in later life. Blood pressure measurements were lower in children aged 13-16 years old who were fed banked human milk during infancy.</p>	<p>Singhal, A., Cole, T.J. &amp; Lucas, A. (2001). <b>Early nutrition in preterm infants and later blood pressure: two cohorts after randomized trials.</b> <i>The Lancet</i>, 357, 413-19</p>
<p><sup>2</sup><b>Reduced risk of obesity</b>  <i>Approximately 29 percent of the adult Canadian population is obese and more than 50 percent are overweight. Breastfeeding significantly reduces the likelihood of overweight and obesity and associated health risks.</i></p>	<p>Children who were almost exclusively breastfed for the first six months were 22 percent less likely to become overweight as adolescents.</p>	<p>Gillman, M.W. et al. (2001). <b>Risk of overweight among adolescents who were breastfed as infants.</b> <i>JAMA</i> 285: 2461-67.</p>
<p><b>Reduced risk of Diabetes</b>  <i>Breastmilk is associated with "metabolic imprinting" changing the number and/or size of adipocytes. Human milk contains a large number of bioactive factors including insulin, leptin, adrenal steroids, T3 and T4. Breastfed babies have more control over their intake, have higher positive contact between parent and child, and in adolescence report closer parent-child relationships.</i></p>	<p>Breastfeeding is associated with decreased obesity and a corresponding decrease in Type II diabetes. The effect is supported by epidemiological evidence and explainable through metabolic imprinting and behavioural differences. The evidence in this review of the literature, however, is still controversial.</p>	<p>Balaban, G. &amp; Silva, G.A.P. (2004). <b>Protective effect of breastfeeding against childhood obesity.</b> <i>Jornal de Pediatria</i> 80(1), 7-16.</p>

<sup>1</sup> INFACCT Canada. (n.d.). Fact sheets: Healthy babies. Retrieved Nov. 8, 2005 from <http://www.infactcanada.ca/FactSheets.htm>

<sup>2</sup> Ibid.

## BREASTFED CHILDREN: PREVENTION OF CHRONIC DISEASE CONT.

<p><b>Increased risk of chronic diseases with bottle feeding with artificial baby milk</b></p>	<p>A review of infant feeding practices and childhood chronic diseases shows increased risk for Type 1 diabetes, celiac disease, some childhood cancers and inflammatory bowel disease associated with artificial infant feeding.</p>	<p>Davis, M.K. (2001). <b>Breastfeeding and chronic diseases in childhood and adolescence.</b> <i>Pediatr Clin North Amer</i> 48, 125-41.</p>
<p><sup>3</sup><b>Increased risk of asthma. Formula fed babies have a 50 percent higher risk of wheezing and asthma.</b></p>	<p>Increased risk of asthma. A study of 2184 children done by the Hospital for Sick Children in Toronto determined that the risk of asthma and wheezing was approximately 50 percent higher when infants were formula fed compared to infants who were breastfed for nine months or longer.</p>	<p>Dell, S. &amp; To, T. (2001). <b>Breastfeeding and asthma in young children.</b> <i>Arch Pediatr Adolesc Med</i> 155, 1261-65.</p>

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<sup>3</sup> INFACT op. cit.

## BREASTFED CHILDREN: PREVENTION OF ACUTE DISEASE & DEATH

<p><sup>4</sup><b>Breastfeeding reduces the incidence of otitis media (ear aches).</b>  <i>The average cost of treating otitis media per child under the age of two has been estimated to be \$US138 million in a population of 5 million.</i></p>		<p>Niemela, M. et al. (1999). <b>Cost arising from otitis media.</b> <i>Acta Paediatrica</i> 88, 553-56.</p> <p>Alsarraf, R. Gates. (1999). <b>The real cost of otitis media.</b> <i>Acta Paediatrica</i> 88, 487-8.</p>
<p><sup>5</sup><b>Breastfeeding reduces the risk of gastrointestinal disease.</b></p>	<p>Studies from the republic of Belarus show that those infants exclusively breastfeeding at 3 months had a 40 percent lower risk of developing gastrointestinal infections and a 46 percent lower risk of developing atopic eczema.</p>	<p>Kramer, M.S. et al. (2001). <b>A randomized trial in the Republic of Belarus Promotion of Breastfeeding Intervention Trial (PROBIT) [electronic version].</b> <i>JAMA</i> 285, 413-20.  <i>(see BFHI section for further results of this study)</i></p>
<p><b>Breastfed babies are less likely to die from infectious diseases, SIDS, or injuries.</b>  <i>While the effects seen in infectious disease and SIDS may be due may be due to the qualities of Breastmilk, breastfeeding is a complex behaviour leading to a variety of protective effects. If all babies were breastfed then it would prevent 1.8 deaths per 10 000 live births in the US, or 720 deaths per year.</i></p>	<p>The effect of breastfeeding on post-neonatal mortality between 28 days and 1 year. From causes other than anomaly or tumour. Overall children ever breastfed had 0.79 95 percent confidence interval [CI]: 0.69-0.93) times the risk of never breastfed children for dying in this period. Longer breastfeeding is associated with decreased risk.</p>	<p>Chen, A &amp; Rogan, W.J. (2004). <b>Breastfeeding and the risk of postneonatal death in the United States [electronic version].</b> <i>Pediatrics</i>, 113, 435-9.</p>

<sup>4</sup> INFACT op. cit.

<sup>5</sup> Ibid.

## BREASTFED CHILDREN: IMPROVEMENT OF COGNITIVE DEVELOPMENT

<p><sup>6</sup><b>Breastfeeding improves IQ outcomes.</b>  <i>In New Zealand increased duration of breastfeeding was associated with statistically significant increases in IQ assessed at the ages of 8 and 9. In the UK infants born prematurely, who had received their own mothers milk after birth had an average 8.3 point advantage in IQ scores at ages 7.5 to 8 years of age.</i></p>		<p>Horwood, L.J. et al. (1998). <b>Breastfeeding and later cognitive development and academic outcomes.</b> <i>Pediatrics</i> 101/9. Retrieved from &lt;<a href="http://pediatrics.aappublications.org/cgi/Full/101/1e9">http://pediatrics.aappublications.org/cgi/Full/101/1e9</a>&gt;</p> <p>Lucas, A. et al. (1992). <b>Breastmilk and subsequent intelligent quotient in children born premature.</b> <i>Lancet</i> 339, 261-4.</p>
<p><sup>7</sup><b>Increased cognitive development.</b></p>	<p>To determine the impact of exclusive breastfeeding on cognitive development for infants born small for gestational age, this US based study evaluated 220 infants, using the Bayley Scale of Infant Development at 13 months and the Wechler Preschool and Primary Scales of Intelligence at five years. The researchers concluded that exclusively breastfed (without supplements) small for gestational age infants had a significant advantage in cognitive development without compromising growth.</p>	<p>Rao, MR, Hediger, M.L. &amp; Levine, R.J. et al. (2002). <b>Effect of breastfeeding on cognitive development of infants born small for gestational age.</b> <i>Arch Pediatr Adolesc</i> 156, 651-5.</p>
<p><sup>8</sup><b>Increased risk for infection from contaminated formula</b>  <i>This is one of a growing number of reports of morbidity and mortality associated with E. Sakasaii infection in the newborn</i></p>	<p>This case report from a recent US based outbreak of <i>Enterobacter sakazakii</i> in a neonatal intensive care unit documents the death of a 20 day old infant who developed fever, tachycardia, decreased vascular profusions and seizures at 11 days. The infant died at day 20. <i>E sakazakii</i> cultures were identified from the spinal fluid and traced to contaminated powdered infant formula used in the NICU.</p>	<p>Weir, E. (2002). <b>Powdered infant formula and fatal infection with <i>Enterobacter sakazakii</i>.</b> <i>CMAJ</i> 166.</p>

<sup>6</sup> INFACT op. cit.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

## BREASTFEEDING BENEFITS FOR MOTHERS

<p><sup>9</sup><b>Breastfeeding decreases a mother's risk of breast cancer</b></p>	<p>This case controlled study of 608 breast cancer cases, demonstrated that the longer the lifetime of breastfeeding the greater risk reduction for breast cancer. This relationship existed for both pre- and postmenopausal women and confirms previous research establishing a link between breastfeeding and reduction of breast cancer risk.</p>	<p>Zheng T. et al. (2001). <b>Lactation and breast cancer: a case-control study in Connecticut.</b> <i>Br J Cancer</i> 84, 1472-76.</p>
<p><b>Breastfeeding reduces the likelihood of breast cancer in mothers with BRCA mutations</b></p>	<p>Carriers of the BRCA1 mutation have an 80 percent lifetime risk of breast cancer and can see their risk reduced (for each month of breast-feeding, OR = 0.98, 95 percent CI = 0.97 to 0.99; P<sub>trend</sub> &lt; .001).</p>	<p>Jernström, H., Lubinski J. &amp; Lynch H.T. (2004). <b>Breast-feeding and the risk of breast cancer in BRCA1 and BRCA2 mutation carriers.</b> <i>Journal of the National Cancer Institute</i> 96(14), 1094-98.</p>
<p><sup>10</sup><b>Breastfeeding decreases a mother's risk of developing ovarian cancer</b></p>	<p>Women who do not breastfeed have a 1.6 times greater risk of developing ovarian cancer than women who breastfeed.</p>	<p>Gwinn, M.L. (1990). <b>Pregnancy and oral contraceptives and the risk of epithelial ovarian cancer.</b> <i>J Clin Epidemiol</i> 43, 559-68.</p> <p>Rosenblatt, K.A. et al. (1993). <b>Lactation and the risk of epithelial ovarian cancer.</b> <i>Int J Epidemiol</i> 24, 499-503.</p>
<p><sup>11</sup><b>Breastfeeding decreases a mother's risk of developing endometrial cancer</b></p>	<p>Studies show that the longer a woman breastfeeds, the less likely she is to get endometrial cancer.</p>	<p>Rosenblatt, K.A. et al. (1995). <b>Prolonged lactation and endometrial cancer.</b> <i>Int J Epidemiol</i> 24, 499-503.</p> <p>Petterson, B. et al. (1986). <b>Menstruation span- a time limited risk factor for endometrial carcinoma.</b> <i>Acta Obstst Gyneocol Scand</i> 65, 247-55.</p>
<p><sup>12</sup><b>Breastfeeding decreases chances of osteoporosis</b></p>	<p>Breastfeeding mothers and their children have a lower risk of developing osteoporosis. Women who do not breastfeed have a 4 times greater risk for osteoporosis than women who do breastfeed.</p>	<p>Blaauw, R. et al. (1994). <b>Risk factors for development of osteoporosis in a South African population.</b> <i>SAMJ</i> 84, 328-32.</p>

<sup>9</sup> INFAC Canada. (n.d.). Fact sheets: Healthy mothers. Retrieved Nov. 8, 2005 from <http://www.infactcanada.ca/FactSheets.htm>

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.