

Breastfeeding Support as a Primary Prevention Strategy for Type 2 Diabetes Mellitus

2nd International Meeting on Indigenous Child Health:
Solutions, Not Problems

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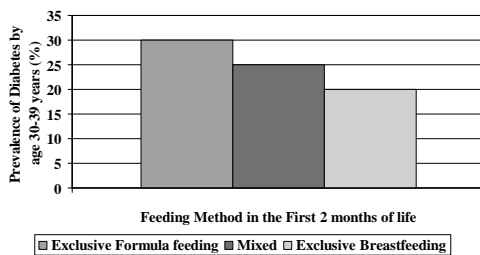
Objectives

- ≈ 1. Epidemiologic and clinical associations of early infant nutrition with disease later in life.
- ≈ 2. Describe the prevalence and correlates of successful breastfeeding in various populations.
- ≈ 3. Identify practices and programs that support breastfeeding.

Faculty Disclosure

- ≈ I have no relevant financial relationships with the manufacturer(s) or any commercial product(s) and/or provider of commercial services discussed in this CME activity.
- ≈ I do not intend to discuss an unapproved/investigative use of a commercial product/device in my presentation.

Prevalence of type 2 diabetes mellitus among Pima Indians aged 30-39 years by feeding method in the first 2 months of life



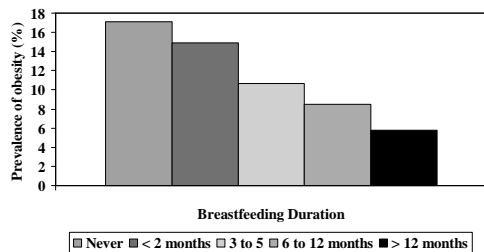
Pettitt, et al, Lancet, 1997

Type 2 diabetes mellitus in children: prenatal and early infancy risk factors among Native Canadians

Condition	Adjusted Odds Ratio (95% CI)
Pregnancy diabetes status	
None	1.00
Gestational	4.40 (1.38-14.1)
Preexisting	14.4 (2.86-72.5)
Breastfeeding during infancy	
None	1.00
= 12 months	0.24 (0.07-0.84)

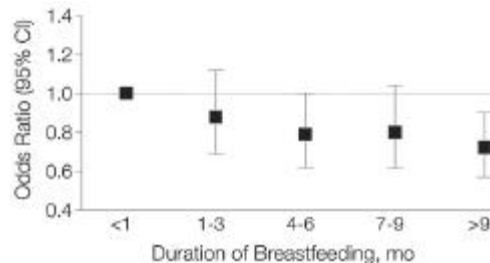
Young, et al, Arch Pediatr Adolesc Med, 2002

Prevalence of obesity among German school children by duration of breastfeeding



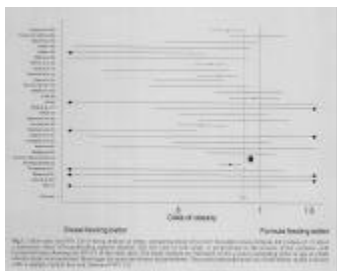
Von Kries, et al, BMJ, 1999

Adjusted odds ratios for overweight in adolescents in the USA by duration of breastfeeding in infancy



Gilman, et al, JAMA, 2001

Effect of Infant Feeding on the Risk of Obesity Across the Life Course: A Quantitative Review of Published Evidence



Effect of Infant Feeding on the Risk of Obesity Across the Life Course: A Quantitative Review of Published Evidence
 Christopher G Owen, Richard M Martin, Peter H Whitchap, George Davey Smith, Derek G Cook.
Pediatrics. Evanston: May 2005; Vol.115, Iss. 5; pg. 1367, 11 pgs

Breastfeeding and subsequent obesity and diabetes: potential mechanisms

- ⌘ Regulation of energy intake
- ⌘ Metabolic programming
 - ⌘ Insulin?
 - ⌘ Leptin?
 - ⌘ Ghrelin?
- ⌘ Residual confounding by attributes of mothers and/or family environment
- ⌘ Others?

Developmental self-regulation of energy intake

- ⌘ Breastfeeding allows infant to control intake based on internal satiety cues
- ⌘ Bottle-fed infants may be encouraged to finish bottle even if they are full
- ⌘ This may lead to later differences in ability to self-regulate energy intake

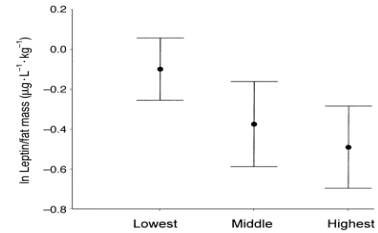
Learned self-regulation of energy intake

- ⌘ Child feeding practices & parental control over feeding
 - ⌘ Mothers who breastfed for ≥ 12 mo reported lower levels of control over feeding at 18 mo (Fisher et al., 2000)
 - ⌘ Highly controlling feeding practices may interfere with child's ability to self-regulate energy intake

Infant feeding, plasma insulin & weight gain

- ⌘ Formula-fed infants have higher plasma insulin levels and prolonged insulin response at 6 d of age
- ⌘ Higher insulin levels stimulate greater adipose tissue deposition, and have been associated with subsequent ? weight gain & obesity in Pima Indian children 5-9 y of age

Ratio of leptin concentration to fat mass at 13-16 y of age, by tertile of human milk intake by preterm infants in early life



Singhal et al., 2002

Infant feeding and plasma leptin and ghrelin: postulated mechanisms

- ⌘ Greater leptin sensitivity could contribute to improved responsiveness to energy balance
- ⌘ Lower Ghrelin levels could lead to less appetite stimulation

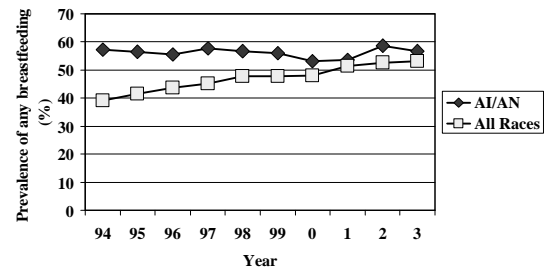
Residual confounding?

- ⌘ Physical activity
 - ⌘ Breastfeeding associated with healthier lifestyle, greater physical activity?
- ⌘ Environmental Exposures
 - ⌘ Plastics

What is the current state of Breastfeeding in Indian country?



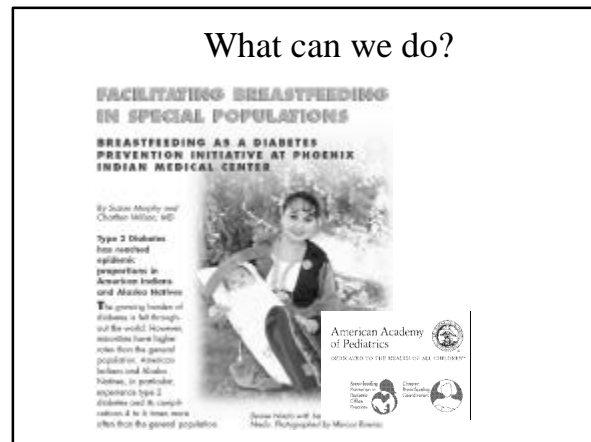
Trends of the prevalence of any breastfeeding by ethnicity by year, CDC's PedNSS



PedNSS includes data from 5 American Indian WIC programs

	N	Ever BF	BF at 6 months	BF at 12 months	Exclusive BF at 3 months	Exclusive BF at 6 months
Race/ethnicity						
American Indian or Alaska	904	67.3±5.5	33.7±5.1	16.7±4.0	30.7±5.1	11.3±2.9
Asian	1432	81.9±3.1	47.1±4.2	24.2±3.4	43.2±4.2	18.5±3.2
Native Hawaiian and other	365	78.5±6.9	51.2±8.8	28.0±8.4	43.0±8.8	17.5±7.5
Black or African American	4921	59.6±2.3	27.1±2.1	13.5±1.7	29.7±2.2	10.0±1.4
White	21409	75.7±1.0	41.5±1.1	21.5±0.9	40.9±1.1	14.6±0.8
Hispanic or Latino	5832	79.0±1.7	42.0±2.1	22.0±1.8	43.9±2.2	14.1±1.5

Breastfeeding Practices — Results from the 2005 National Immunization Survey (CDC)



Breastfeeding U.S. Preventive Services Task Force

- Recommends structured breastfeeding education and behavioral counseling programs to promote breastfeeding. **B recommendation.**
- 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. **I recommendation.**

Education Programs

- SDPI to fund full-time lactation educator staff
- Coordination with WIC breastfeeding CLE
- Breastfeeding education
 - OB orientation, classes

Behavioral Counseling and Support Programs

- 24-hour “hotline”
 - for patients, family, and staff
- Inpatient lactation educator rounds and consultations
- Support groups

Creating the right environment

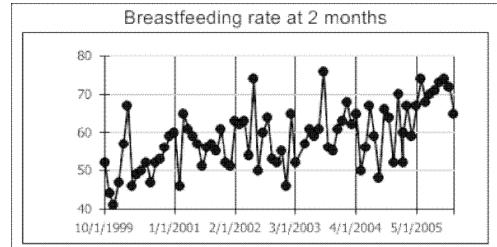
- PIMC Breastfeeding Policy and Procedure
- PIMC Employee Breastfeeding Policy
- Staff Education efforts
- Provide preceptorship opportunities for WIC aides
 - Peer support in Utah Native American WIC (Long, et al, J Hum Lact, 1995)

Measure it



- ⌘ Breastfeeding Registry
- ⌘ Breastfeeding Information fields for RPMS
- ⌘ Patient and Family Education Codes
- ⌘ Feeding choice fields in pilot testing phase

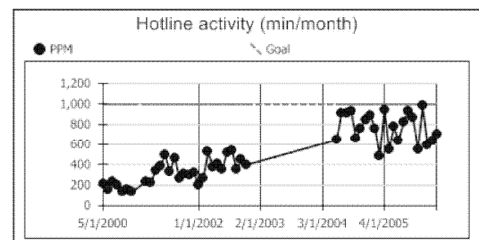
Trends in the prevalence of breastfeeding at 8 weeks among mothers/infant pairs at PIMC, 1999 to 2006



The Effectiveness of Primary Care-Based Interventions to Promote Breastfeeding: Systematic Evidence Review and Meta-Analysis for the US Preventive Services Task Force ANNALS OF FAMILY MEDICINE, JULY/AUGUST 2003

- ⌘ One additional woman would breastfeed for every 3 to 5 women who receive education

Trends in the amount of minutes of breastfeeding hotline use at PIMC, 1999 to 2006





Close to the Heart

Easy Guide to Breastfeeding for
American Indian and Alaska Native Families
1-800-994-9662 or www.4woman.gov

For breastfeeding support questions, please call
toll-free 1-877-868-9473 (1-877-TOT-WISE)

