Presenter Disclosures

I have no financial interests or relationships to disclose.
Some women are questioning whether the health benefits are worth it.

**TODAYShow**

March 16 2009: Writer Hanna Rosin and NBC’s chief medical editor Dr. Nancy Snyderman discuss whether breastfeeding really has significant health benefits.
The benefits of breastfeeding have been greatly exaggerated, a leading Canadian pediatrician says.

Professor Michael Kramer, from Montreal's McGill University, claimed much of the information used to persuade mothers to breastfeed was either wrong or out of date.
The Breastfeeding Literature

- >600 articles in the past year
- >1500 articles in the past two years
- >3000 articles in the past five years
Limitations of BF Studies

- Definitions of breastfeeding; misclassification
- Lack of randomization; confounding
- “Wide range in quality of evidence”
Breastfeeding and Maternal and Infant Health Outcomes in Developed Countries

Agency for Healthcare Research and Quality (AHRQ)

U.S. Department of Health and Human Services

April 2007
- 5-year contract to review all relevant scientific literature.
- Based on rigorous, comprehensive syntheses and analyses of over 9,000 studies.
- Emphasizes detailed documentation of methods, rationale, and assumptions.
- Collaborate with external organizations so that a broad range of experts is included.
### AHRQ: Positive Findings for Infants

<table>
<thead>
<tr>
<th>Condition</th>
<th>% less in BF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otitis media</td>
<td>50%</td>
</tr>
<tr>
<td>Gastroenteritis</td>
<td>64%</td>
</tr>
<tr>
<td>Necrotizing enterocolitis</td>
<td>82%</td>
</tr>
<tr>
<td>Lower respiratory tract diseases</td>
<td>72%</td>
</tr>
<tr>
<td>Eczema</td>
<td>42%</td>
</tr>
<tr>
<td>Asthma – no family hx, family hx</td>
<td>27%, 40%</td>
</tr>
<tr>
<td>Obesity</td>
<td>24%</td>
</tr>
<tr>
<td>Type I diabetes</td>
<td>27%</td>
</tr>
<tr>
<td>Type 2 diabetes</td>
<td>39%</td>
</tr>
<tr>
<td>Childhood leukemia</td>
<td>19%</td>
</tr>
<tr>
<td>Sudden Infant Death Syndrome</td>
<td>36%</td>
</tr>
</tbody>
</table>
Common Illnesses

- **Ear Infection**: NNT ~ 6
  - 2 million infants < 6 months each year
  - If 80% of infants breastfed exclusively for 3 months, >300,000 fewer would have an ear infection before 6 months

- **Vomiting and diarrhea**: NNT ~ 2
  - Almost all formula fed infants have 1st yr
  - < ½ of exclusively breastfed have 1st yr.
Serious Illness: Pneumonia

- Exclusive BF for 4 or more months associated with a **72% reduction** in hospitalizations for lower respiratory tract disease when compared to formula feeding

- **NNT = 26**
NNT: Number Needed to Treat

- Breastfeeding & Pneumonia: = 26
- Statin to prevent one heart attack = 69
- Screen high BP to prevent one MI = 275
- Screen cholesterol to prevent one MI = 400
Effect on Death: SIDS

- Ever breastfeeding associated with a 36% reduction in risk of SIDS
- Approximately 1 in 2000 die from SIDS
- One death from SIDS is prevented for every 5500 children breastfed.

- Colonoscopy to prevent 1 death = 1300
- Mammography to prevent 1 death = 2400
Intellectual Development

- AHRQ: Equivocal or insignificant infant outcomes
### Table 3. Wechsler Abbreviated Scales of Intelligence Results

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>ICC</th>
<th>Cluster-Adjusted Mean Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocabulary</td>
<td>53.5 (11.6)</td>
<td>46.9 (11.4)</td>
<td>0.28</td>
<td>+4.9 (+0.4 to +9.3)</td>
</tr>
<tr>
<td>Similarities</td>
<td>56.6 (9.9)</td>
<td>50.7 (11.7)</td>
<td>0.29</td>
<td>+4.6 (+0.2 to +9.0)</td>
</tr>
<tr>
<td>Block designs</td>
<td>57.2 (9.4)</td>
<td>54.6 (10.3)</td>
<td>0.21</td>
<td>+1.9 (−1.7 to +5.5)</td>
</tr>
<tr>
<td>Matrices</td>
<td>52.8 (10.1)</td>
<td>50.9 (9.9)</td>
<td>0.20</td>
<td>+1.8 (−1.9 to +5.5)</td>
</tr>
<tr>
<td>Verbal IQ</td>
<td>108.7 (16.4)</td>
<td>98.7 (16.0)</td>
<td>0.31</td>
<td>+7.5 (+0.8 to +14.3)</td>
</tr>
<tr>
<td>Performance IQ</td>
<td>108.6 (15.1)</td>
<td>104.8 (15.4)</td>
<td>0.24</td>
<td>+2.9 (−3.3 to +9.1)</td>
</tr>
<tr>
<td>Full-scale IQ</td>
<td>109.7 (15.4)</td>
<td>101.9 (15.8)</td>
<td>0.31</td>
<td>+5.9 (−1.0 to +12.8)</td>
</tr>
</tbody>
</table>

PROBIT study, randomized 17,000 in Belarus
Teacher Ratings also increased.
Breastfeeding & College

- Sibling Pairs
- Increased HS GPA
- Increased college
- “For every month breastfed:
  - 1% increase high school GPA
  - 2% increase going to college.”

The Effect of Breast Feeding on Educational Attainment: Evidence from Sibling Data
Are these grades really the best you could have accomplished, son?

From a non-breastfed son, missing the long-chain polyunsaturated fatty acids in breastmilk, so essential for intellectual and retinocortical development, I guess it is, dad.
Breastfeeding and Pediatric Obesity

Figure 1. Effect of breast-feeding vs formula feeding on childhood obesity: covariate-adjusted odds ratios of nine studies and pooled odds ratio.

Does Breastfeeding Reduce the Risk of Pediatric Overweight? CDC. 2007
Also WHO and AHRQ
Obesity

- Sibling pairs only one sibling breastfed.
- Breastfed had adolescent BMI 0.39 standard deviations lower.
- This is equivalent to a difference of >13 pounds for a 14-year-old child.
- Breastfed less likely to reach those BMI thresholds for overweight and obese.

<table>
<thead>
<tr>
<th>Condition</th>
<th>% less in BF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type II Diabetes (reduction in risk per year of lactation)</td>
<td>12%</td>
</tr>
<tr>
<td>Postpartum depression</td>
<td>Association</td>
</tr>
<tr>
<td>Breast cancer (reduction per year of lactation)</td>
<td>28%</td>
</tr>
<tr>
<td>Ovarian cancer</td>
<td>21%</td>
</tr>
</tbody>
</table>
## Premenopausal Breast Cancer

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Cases, No.</th>
<th>Person-Years, No.</th>
<th>Age-Adjusted, HR (95% CI)</th>
<th>Covariate-Adjusted, HR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never breastfed</td>
<td>92</td>
<td>44,341</td>
<td>1 [Reference]</td>
<td>1 [Reference]</td>
</tr>
<tr>
<td>Ever breastfed</td>
<td>516</td>
<td>313,215</td>
<td>0.87 (0.69-1.08)</td>
<td>0.75 (0.56-1.00)</td>
</tr>
<tr>
<td>Duration of breastfeeding, mo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1</td>
<td>39</td>
<td>19,919</td>
<td>1.04 (0.71-1.51)</td>
<td>0.93 (0.63-1.38)</td>
</tr>
<tr>
<td>&gt;1-3</td>
<td>30</td>
<td>20,294</td>
<td>0.80 (0.53-1.21)</td>
<td>0.72 (0.46-1.11)</td>
</tr>
<tr>
<td>&gt;3-6</td>
<td>38</td>
<td>33,414</td>
<td>0.62 (0.43-0.91)</td>
<td>0.54 (0.36-0.82)</td>
</tr>
</tbody>
</table>

Stuebe, A. M. Arch Intern Med Aug 2009;169:1364. 60,075 Parous Women in the Nurses' Health Study II From 1997 to 2005
Cardiovascular Disease

Women who never breastfed vs. women who breastfed >12 months:

- High blood pressure: 42.1% vs 38.6%
- High cholesterol: 14.8% vs 12.3%
- Diabetes: 5.3% vs 4.3%
- Cardiovascular Disease: 9.9% vs 9.1%

- Schartz EB. Duration of lactation and risk factors for maternal cardiovascular disease; Obstet Gynecol. 2009 May;113(5):974. 139,681 postmenopausal women enrolled in the Women's Health Initiative. CVD = coronary disease, stroke, congestive heart failure.
AHRQ: Equivocal Maternal Outcomes

- Return-to-pre-pregnancy weight
- Postpartum weight loss
- Osteoporosis
## AHRQ: Positive Findings for Infants

<table>
<thead>
<tr>
<th>Condition</th>
<th>% less BF</th>
<th>Exclusive</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otitis media</td>
<td>50%</td>
<td>yes</td>
<td>&gt;3m</td>
</tr>
<tr>
<td>Gastroenteritis</td>
<td>64%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower respiratory tract dis</td>
<td>72%</td>
<td>yes</td>
<td>&gt;4m</td>
</tr>
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<td>42%</td>
<td>yes</td>
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<td>Obesity</td>
<td>24%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type I diabetes</td>
<td>29%</td>
<td>yes</td>
<td>&gt;5m</td>
</tr>
<tr>
<td>Childhood leukemia</td>
<td>19%</td>
<td></td>
<td>&gt;6m</td>
</tr>
<tr>
<td>SIDS</td>
<td>36%</td>
<td></td>
<td>&gt;1m</td>
</tr>
</tbody>
</table>
AHRQ: Positive Findings for Infants

- 9 positive findings in FT infants
- 4 only found with exclusive BF
- 6 require BF for > 3 months or more
- Decrease type 1 DM only with EBF for > 5 months
- Decrease leukemia only with > 6 months
## Respiratory Infections

<table>
<thead>
<tr>
<th>Breastfeeding</th>
<th>URTI</th>
<th>LRTI</th>
<th>GI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial 6m</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>EBF 4m, none after</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td>EBF 4m, partial after</td>
<td>35%</td>
<td>50%</td>
<td>59%</td>
</tr>
</tbody>
</table>

Duijts, L. et al. Ped 2010;126:e18. 4,164 infants in Netherlands. 54% LRTI 7-12m. EBF 6m trended even lower in 1st 6m & LRTI at 7-12m, only 58 infants (1.4%).
Costs of Formula Feeding

- Families: ~$2,000 for the first year\(^1\)
- Food assistance: increased costs for WIC
- Employers: loss of productivity
- Health care: $13 billion a year\(^2\)
- Child abuse & neglect: OR 2.8 after adjusting\(^3\)
- Deaths: 911 a year\(^2\)

1. US Breastfeeding Committee
2. Bartick, M. *Pediatrics* 2010;125;e1048
“Human milk is species-specific...making human milk uniquely superior for infant feeding.”
Breasfeedin
ur doin it wrong
Environmental Benefits
(ADA Position Paper, 2005)

- Human milk is a renewable natural resource.
- Produced and delivered directly
- Formula requires manufacturing, packaging, shipping, disposing of containers
  - 550 million formula cans in landfills / year
  - 110 billion BTUs of energy to process and transport
Bottom Line

- The value of breastfeeding is no longer debatable.

- Breastfeeding optimizes a child’s chances of reaching his/her potential
  - But is not a magic guarantee
Policy Implications

- The policy relevant question is how to support women and families
  - What can the health care system do?
  - What can employers do?
  - What can society do?
  - What can government do?
<table>
<thead>
<tr>
<th>Health People 2010 Objectives</th>
<th>National 2007 Rates in US</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INITIATION AND DURATION OF BREASTFEEDING</strong></td>
<td></td>
</tr>
<tr>
<td>75% initiating breastfeeding</td>
<td>75</td>
</tr>
<tr>
<td>50% any BF at 6 months</td>
<td>43</td>
</tr>
<tr>
<td>25% any BF at 12 months</td>
<td>22</td>
</tr>
<tr>
<td><strong>EXCLUSIVE BREASTFEEDING</strong></td>
<td></td>
</tr>
<tr>
<td>40% exclusively BF at 3 months</td>
<td>33</td>
</tr>
<tr>
<td>17% exclusively BF at 6 months</td>
<td>13</td>
</tr>
</tbody>
</table>
Disparities in Breastfeeding

- Non-Hispanic blacks 58%
- Low maternal education 67%
- Poverty income ratio <100% 67%
- Receiving WIC 68%
- Age <20yrs 60%
- Unmarried 61%

National Immunization Survey, Gen Pop 75%
BF Infants Given Formula

National Immunization Survey, 2 days 25% in 2007, 56% exclusivity in the hospital.
NYC Breastfeeding Rates

Besculides, J Urban Health. 2005;82:198
CY 2009 | Non-NICU Babies | Exclusive Breastfeeding and/or Breastmilk

% Exclusive Breastfeeding and/or Breastmilk

- Bellevue: 25%
- Coney Island: 20%
- Elmhurst: 17%
- Harlem: 42%
- Kings County: 38%
- Lincoln: 42%
- Metropolitan: 34%
- Queens: 26%
- Woodhull: 44%
- All Facilities: 30%
BF Rates Queens NY

<table>
<thead>
<tr>
<th></th>
<th>Birth</th>
<th>1 Month</th>
<th>3 Month</th>
<th>12 Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF</td>
<td>84</td>
<td>92</td>
<td>70</td>
<td>50</td>
</tr>
<tr>
<td>EBF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

p = 0.05

p = 0.012
When I was your age, I had to crawl five miles through snow to breast-feed.
Obstacles to Breastfeeding

- My baby was born premature so I couldn't nurse.
- My baby preferred the bottle.
- I didn't have enough milk to nurse.
- My breasts were much too small to nurse.
- My breasts were much too large to nurse.
- My baby refused to take the breast.
- I had to stop because I got breast fever.

BREASTFEEDING FALSIES
Obstacles to EBF in the Hospital

- Separated Mom and Baby
  - C-sections
  - NICU
  - Nursery
- Maternal issues
  - Latch
  - Insufficient milk supply – 50%
Nurse, bring the baby back immediately! The mother is bonding with the fetal monitor.
“They also left a pamphlet on the benefits of breast feeding.”
Boston City Before & After Baby Friendly


Inner city hospital, 1995 (before), 1998 (intent), 1999 (BF)
2001 US Breastfeeding

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>Baby Friendly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>69.5%</td>
<td>83.8%</td>
</tr>
</tbody>
</table>

PEDIATRICS 116, 2005: 628-634
Other Studies

- Switzerland: increased BF & EBF
- Randomized study Belarus: increased BF for 12 months & EBF for 6 months
- Scotland: 28% increase exclusivity
- Germany: increase at 4-6 months
- China: doubled exclusivity
- Cuba: increase exclusivity 25% to 72%
- Decreased infant abandonment: Russia (50 to 28/10,000 births), Costa Rica
“As a scientist, I recognize that research involving human populations rarely produces consistent results. Contradictions in epidemiological research often confound and confuse… However, in one area, we appear to have the closest thing to a consensus opinion as is possible in clinical science; nearly all of the studies indicate that implementation of Baby-Friendly Hospital policies results in increased breastfeeding rates.”

Editors Note, Heinig, M. Jane. 2010;26:7 J Hum Lact
Baby Friendly USA

- 99 designated “Baby-Friendly” hospitals and birth centers
- ~200 hospitals and birth centers have officially signaled their plans to complete the process.
Building a City-Wide Breastfeeding Promotion Initiative in a Large, Multi-site, Public Hospital System
HHC

- HHC: public hospital and health care system in the country
  - 1.3 million patients
  - 450,000 uninsured patients
  - Delivering over 23,000 babies
HHC

- 11 acute care hospitals
- 4 skilled nursing facilities
- 6 diagnostic and treatment Centers
- 80+ community and school-based clinics
Challenges

- Physical structure of system
- Organizational and administrative
- Diversity (facilities and patients)
- Financial (HHC and our patients)
- Underserved patient base
Strengths

- Our staff – passion, experience
- Management buy-in (all levels)
- Political Support – Mayor, Commissioner
- Grant-funded start up
How We Did It

- Established governance structure
- Set a clear vision
  - Goals, objectives, deliverables
- Set Corporate breastfeeding policy
- Implemented the program
Governance Structure

Executive Committee

Program  Admin  Education  Evaluation

Hospital Staff and Multi-disciplinary Teams
Staffing

- Program-specific staff at each facility
  - Lactation Consultants (clinical)
  - Breastfeeding Facilitators (administrative)
- Corporate staff
  - Clinical director
  - Administrative director
Key Program Elements

- Access
- Patient Literacy
- Provider Education
- Program Monitoring and Evaluation
Access

• Support for mothers, babies and families throughout care continuum

  ▪ VNS Program for exclusive & late preterm (only 2 boroughs).
  ▪ Peer Counselor Program – never implemented.
  ▪ Breast Pump Loaner Program
  ▪ Link to community services (e.g. WIC)
Patient Literacy

- Parenting classes, breastfeeding clinics, support groups
- Educational materials
- Breastfeeding-friendly discharge package
Provider Education

- BabyFriendly 18 hour course
- IBCLC, CLC
- Ancillary staff courses (3 and 1 hour)
- Online courses
- Grand rounds, symposia, etc.
Monitoring and Evaluation

- Standard methodology
- Automated whenever possible
- Routine data collection & reporting - transparent
- Qualitative & quantitative
- Process and outcome measures
- Established 2007, rev 2010
Monitoring and Evaluation

- Monthly, quarterly, annual data reports
- Program compliance
  - Mock audits
  - Facility walk-throughs
- Collaborative research activities
- Outcome measures on HHC breastfeeding website.
2009 Infant Nutrition at Discharge

- Breastfeeding and/or breast milk only: 30%
- Breastfeeding & formula: 55%
- Formula only: 15%
- Any breastfeeding: 85%
BF Rates

BF

- 2004: 54%
- 2008: 80%

EBF

- 2004: 15%
- 2008: 29%

p = .000
Other Key Data Elements 2009

- Early latch (within one hour): 44%
- Rooming-in status: 94%
  (6% in newborn nursery)
- Pacifier use: 2%
- NICU Any BF 54%
- NICU EBF 13%
Other Accomplishments

- Infant nutrition module in Electronic Health Record
- Orders required for artificial feeding
- Harlem Hospital = Baby Friendly
- 6 other hospital have started process for Baby Friendly
Conclusion

- Established an evolving breastfeeding program in large public health care system
- Underserved and diverse population
- Great financial challenges
- Baby Friendly-designated facility
- Exclusive Breast Feeding remains challenge
Thanks to the staff at:

- Bellevue Hospital Center
- Coney Island Hospital
- Elmhurst Hospital Center
- Harlem Hospital
- Jacobi Medical Center
- Kings County Hospital Center
- Lincoln Medical and Mental Health Center
- Metropolitan Hospital Center
- North Central Bronx Hospital
- Queens Hospital Center
- Woodhull Medical and Mental Health Center
- HHC Central Office
- New York City Department of Health and Mental Hygiene
Any Questions?