Folic Acid Update for Health Care Professionals

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The Upstate NY Chapter of the March of Dimes

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Folic Acid Update for Health Care Professionals

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Preventing All Folic Acid-Preventable Spina Bifida and Anencephaly

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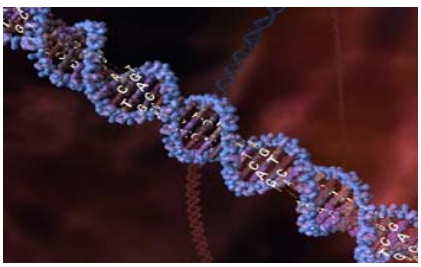
Folic Acid

- Every woman
- Everyday
- 400 Micrograms

Disclaimer

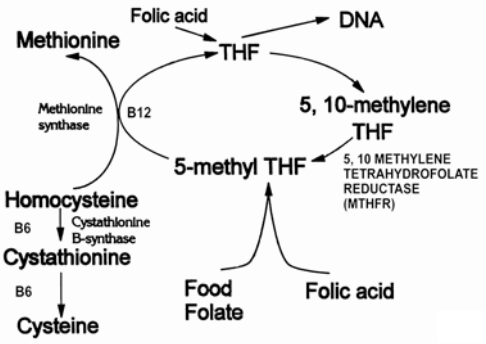
- Dr. Godfrey Oakley
  - Co-Inventor, while at CDC, of a patent that could lead to marketing of folic acid-containing oral contraceptive pills
  - Could be compensated by CDC
  - Paid consultant to Ortho-McNeil on this issue

Folic Acid



DNA Synthesis and Repair

FOLATE METABOLISM



Folic Acid in the 1990's
Decade of Information and Action

- Drug with synthetic folic acid proven to prevent spina bifida
- Homocysteine identified as a major, new risk factor for cardiovascular disease
- Homocysteine an excellent indicator of folate deficiency
- At least half of populations folate deficient

Folic Acid and Spina Bifida Prevention

- 1991 RCT - folic acid prevents spina bifida
- 1992 USPHS/1998 IOM recommendations
  - All women of reproductive age
  - 400 mcg of SYNTHETIC folic acid daily
- 1998 partial folic acid fortification
  - Average woman gets extra 100 mcg daily

Spina Bifida

Spina Bifida

- Partial or full paralysis
- Loss of bowel and bladder control
- Multiple surgeries and hospitalization
- Developmental delays and disabilities

Anencephaly

- Miscarriage
- Fetal Death
- Perinatal Death

Neural Tube Defects

- Estimated 3,000 pregnancies per year affected by NTD in the United States.
- More than one third result in miscarriages or elective abortions
- About 2,000 infants with NTDs born each year.
- Worldwide estimate: 300,000 children with NTDs are born each year.

Neural Tube Defects

- Pre-conception folic acid can prevent approximately 72% of NTD-affected pregnancies

Neural Tube Defects

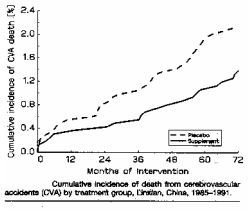
- Neural tube closure occurs during post conception days 18 through 28
- Most women do not yet know that they are pregnant!!

Folic Acid and Cardiovascular Disease

Framingham Data

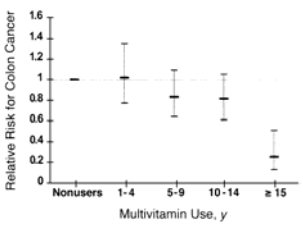
- Increased coronary artery stenosis in people with higher homocysteine levels (Selhub et al., New England Journal of Medicine, 1995, 232(5))
- Elevated homocysteine levels found to be independent risk factor for stroke in elderly (Bostom et al, Annals of Internal Medicine 1999; 131)

Folic Acid and Stroke



- 3,318 adults, randomized to supplements or placebo
- Supplement contained 800 mcg of FA and 23 other vitamins or minerals
- NCI investigators

Folic Acid and Colon Cancer



Harvard School of Public Health Nurses Health Study

- 88,756 women involved in study
- After 15 years of multivitamin use, relative risk of colon cancer was 75% lower.

Key Points for Health Care Providers

- Fifty percent of all pregnancies in the US are unintended, so all women should be counseled about folic acid.
- Recommended dose is 400 mcg/day of synthetic folic acid
- Recommended dose for women with previous NTD affected pregnancies is 4000 mcg per day

Key Points for Health Care Providers

- Three ways to consume adequate folic acid
  - Multivitamins
  - Folic acid pills
  - Super fortified cold breakfast cereals

What is the Recommended Amount of Folic Acid?

400 mcg = 0.4mg = 400µg

or

100% Folic Acid = 100% Folate

(on cereal boxes)

(in addition to dietary intake)

Fortification

- Present fortification levels increase FA consumption by only 100 mcg.
- Need policy change to increase fortification levels

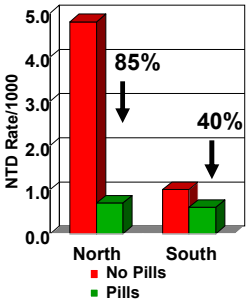
Fortification

- Pre fortification median serum folate:
  - 4.8 ng/ml
- Post fortification median serum folate:
  - 14.5 ng/ml

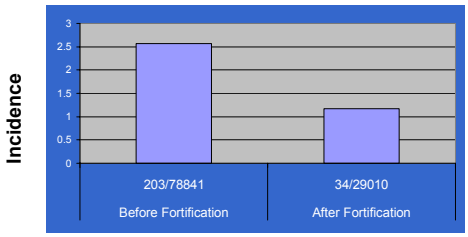
NHANES 1999

China Folic Acid Community Intervention (Good Compliance)

Intervention = 400 mcg folic acid supplement daily



NTD Incidence in Nova Scotia Before and After Fortification



Ratio: NTDs/Births

Source: Persad, VL et al., CMAJ-Aug. 6, 2002; 167 (3) pg. 243

Folic Acid Fortification

- Good but not enough
- Designed to do only part of the prevention that is possible
- Women need to consume more folic acid

How Do We Increase Consumption?

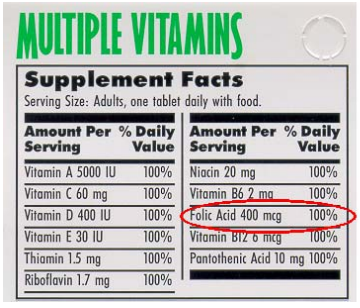
- Vitamin drugs or supplements that contain folic acid
- Breakfast cereals that contain folic acid

Multivitamins

Vitamin B12 Recommendation

- All persons over 50
- 2.4 micrograms of synthetic B 12 a day
- Multivitamins have enough (6 mcg)

Multivitamins



Breakfast Cereal

Folic Acid: 400 micrograms/serving

Breakfast Cereal

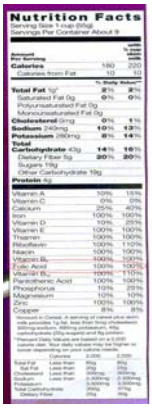
Folic Acid: 400 micrograms/serving

Breakfast Cereal

Folic Acid: 400 micrograms/serving

Breakfast Cereal

- **Nutrition Facts**
  - **Folic Acid 100%**
  - **Folate 100%**

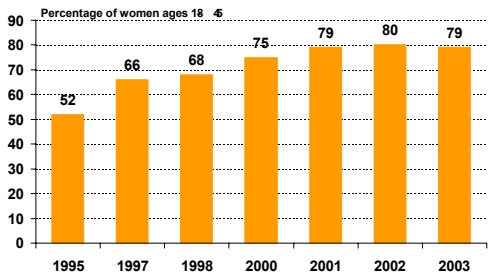


How well are we doing at preventing NTDs?

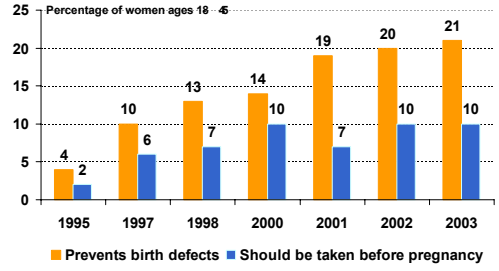
- **March of Dimes surveys show we have a lot of work to do.**

Folic Acid Awareness

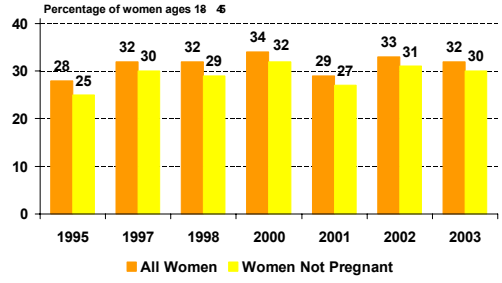
Have You Heard of Folic Acid?



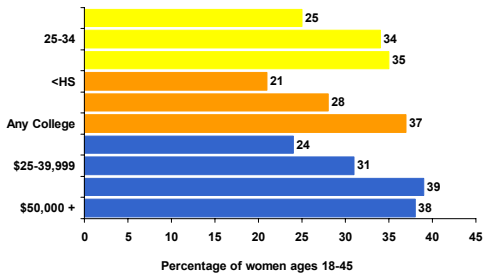
Folic Acid-Specific Knowledge
March of Dimes Folic Acid Survey



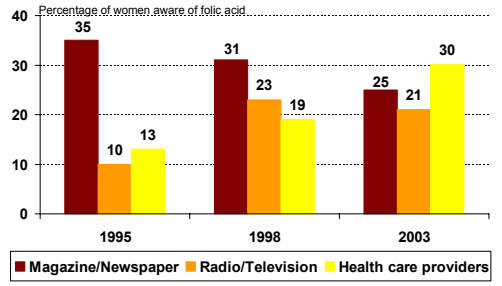
Daily Use of Vitamin Containing Folic Acid
March of Dimes Folic Acid Survey



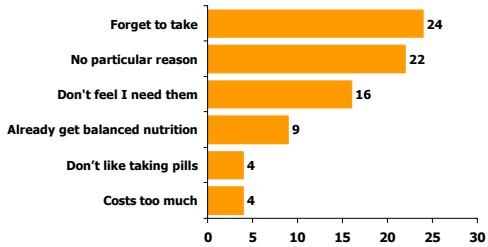
Characteristics of Women Taking Daily Supplement with Folic Acid
March of Dimes Folic Acid Survey, 2003



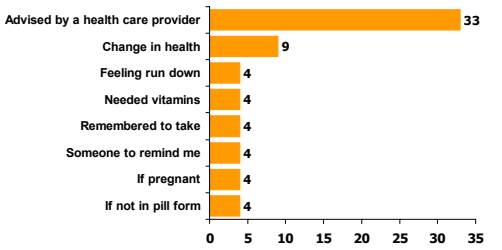
Source of Information on Folic Acid
March of Dimes Folic Acid Survey, Selected Years



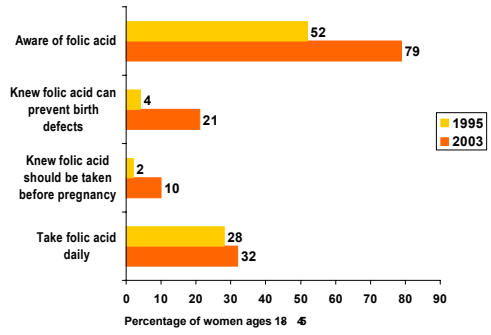
Reasons Why Women Do Not Take a Multivitamin Daily
March of Dimes Folic Acid Survey, 2003



Things Women Reported Might Encourage them to Take a Multivitamin Daily
March of Dimes Folic Acid Survey, 2003



Folic Acid Knowledge and Behavior
1995 and 2003



Where Do We Go From Here?

- How do we increase folic acid consumption among women of reproductive age?
  - Behavioral change promotion
  - Fortification
  - Policy Change
  - Advocacy

Promoting Behavioral Change

- Folic Acid Friendly Offices
  - Private Providers
  - WIC Clinics
  - County Health Department Clinics

Folic Acid Friendly Private Offices

- Physician and mid level continuing education
- Training nursing and office staff
- Patient history forms include question about folic acid or multivitamin use
- Incorporate into anticipatory guidance and other preventive protocols
- Patient education material available

Folic Acid Friendly Offices

- Georgia Folic Acid campaign has material available
  - Folic Acid Friendly Office Checklist
  - Mini-Quiz
  - Sample Educational Packets

GEORGIA FOLIC ACID CAMPAIGN

Working With WIC

- Training nursing and nutrition staff
- Protocols that include FA counseling and promotion during re certification visits and post partum visits
- Educational material available in WIC offices
- Reviewing (state specific) food lists and identifying breakfast cereals with 400 mcg. of folic acid

WIC Approved Super-Fortified Cereals

- Each state has their own list

County Health Department Family Planning Clinics

- Folic Acid Friendly Clinics
- Training physicians, mid level providers (nurse practitioners, midwives, physician assistants) and nurses
- Include FA promotion and counseling in protocols for patients with negative pregnancy tests, during well visits, during family planning visits, and at post partum checks

Advocacy

- Increase Access to Multivitamins
  - Medicaid and insurance coverage for multivitamins

Advocacy

- Increase consumption of enriched and fortified foods
  - WIC-approved food list to contain only enriched grain products and breakfast cereals with 400 mcgs. of Folic Acid
  - Increase present fortification level

Necessary Folic Acid Policy Issues

- Fortification of all flour in the world with folic acid
- Increase RDA to assure prevention of at least 95% of folic acid preventable spina bifida and anencephaly

Money

- CDC needs $100 million a year - $2 million a state for folic acid campaign
- Current $5 million a year
- Supplement program
- Leadership, technical assistance, evaluation