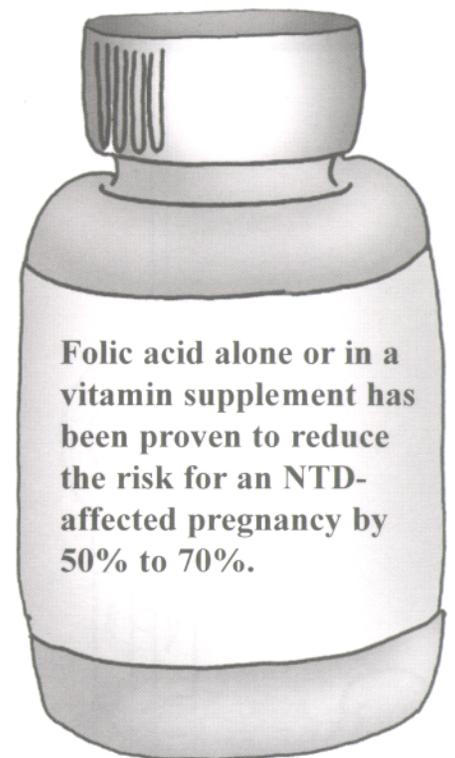

About Folic Acid

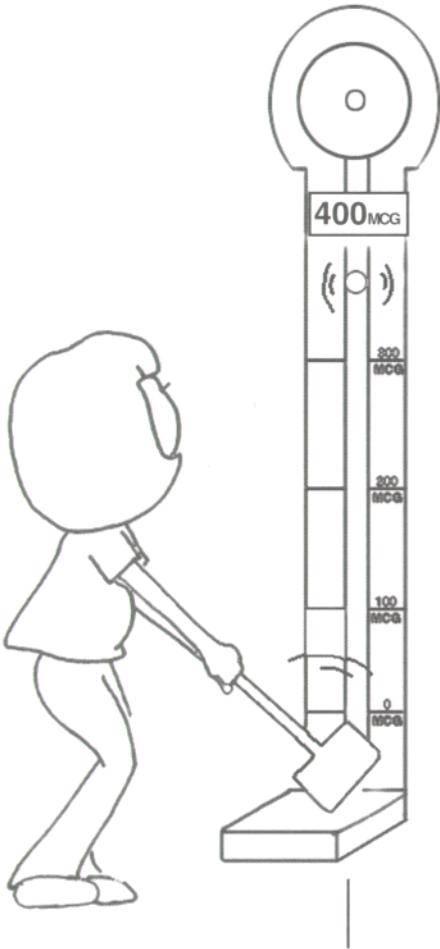
Folic acid in a vitamin supplement, when taken one month before conception and throughout the first trimester, has been proven to reduce the risk for an NTD-affected pregnancy by 50% to 70%. Folic acid, a B-vitamin, is necessary for proper cell growth and development of the embryo. Although it is not known exactly how folic acid works to prevent NTDs, its role in tissue formation is essential. Folic acid is required for the production of DNA, which is necessary for the rapid cell growth needed to make fetal tissues and organs early in pregnancy. **That is why it is important for a woman to have enough folic acid in her body both before and during pregnancy.**

Folate and *folic acid* are different terms for the same B-vitamin. While these two terms are often used interchangeably, we make some distinctions between them. Folate is the B-vitamin form found naturally in foods. Folic acid is not found in natural food sources. Folic acid is the synthetic B-vitamin form that is used in vitamin supplements and added to fortified foods. **Synthetic folic acid is absorbed better than natural food folate.**²

Most of the folate found naturally in foods has a more complex structure than the synthetic folic acid which is found in fortified foods and vitamin supplements. The more complex structure affects the intestine's ability to process and absorb food folate. The body can absorb and use the folic acid found in vitamin supplements and fortified foods more efficiently than it can convert the food folate into a



**Simple Rule:
If you can get
pregnant,
take folic acid.**



usable form. Synthetic folic acid is about twice as absorbable as naturally occurring food folate.³

When Do Women Need to Take Folic Acid?

Women need to get enough folic acid every day throughout their reproductive years. To prevent NTDs, a woman must take folic acid daily at *least* one month before she conceives and continue taking it through the first trimester (three months) of pregnancy. *All women capable of becoming pregnant—not just those planning a pregnancy—should consume enough folic acid every day*, because half of all the pregnancies in the United States are unplanned. Remember, NTDs occur before many women know that they are pregnant.

How Much Folic Acid Is Needed to Prevent NTDs?

- In 1992, the U. S. Public Health Service (PHS) recommended that all women of childbearing age consume 400 micrograms (0.4 milligram) of folic acid every day to reduce their risk of having an NTD-affected pregnancy.
- For women who have already had an NTD-affected pregnancy, the PHS recommends consulting with a doctor about taking a much larger amount of folic acid (4000 micrograms [4 milligrams]), starting one month before conception and continuing throughout the first three months of pregnancy.

- In 1998, the Institute of Medicine (IOM) recommended that to reduce their risk for an NTD-affected pregnancy, women capable of becoming pregnant should take 400 micrograms of **synthetic folic acid** daily, from fortified foods or supplements or a combination of the two, in addition to consuming food folate from a varied diet.

Are Women Getting Enough Folic Acid?

Two-thirds of women in the United States report consuming **insufficient** levels of folic acid, even though there are several ways to get 400 micrograms of folic acid a day.

How Can Women Get Enough Folic Acid?

There are three ways women can get enough folic acid to prevent spina bifida and anencephaly. They can choose to:

1. **Take a vitamin supplement containing 400 micrograms of folic acid daily.**
2. **Eat a fortified breakfast cereal daily which contains 100% of the recommended daily amount of folic acid (400 micrograms).**
3. **Increase consumption of foods fortified with folic acid (e.g., “enriched” cereal, bread, rice, pasta, and other grain products) in addition to consuming food folate from a varied diet (e.g., orange juice and green vegetables).**



1. Take a vitamin supplement with 400 micrograms of folic acid daily.

Taking a vitamin supplement containing folic acid is an easy way to get enough folic acid. Almost all over-the-counter *multivitamins* contain 400 micrograms (0.4 milligram) of folic acid, the amount recommended to prevent NTDs. The label on a multivitamin container will list a vitamin supplement's contents. Recently, more stores are carrying supplements containing folic acid alone. The cost of vitamins can vary considerably, but women can buy vitamins containing folic acid for as little as 50¢ to \$1.00 a month.

A woman should understand that taking too many vitamin supplements is not good for her or her baby. Caution should be taken to prevent the excessive use of multivitamin supplements. Very large amounts of some vitamins can cause problems. For example, too much vitamin A may cause other types of birth defects.

According to the 1997 March of Dimes survey, 30% of all childbearing-age women who are not pregnant take a daily multivitamin supplement containing folic acid. Among women age 25 and under, only 19% take a vitamin supplement daily. Yet this population of women accounts for 39% of all U.S. women giving birth.

Challenges faced by health educators and promoters include:



- Increasing knowledge of women, especially younger women, about the benefits of folic acid.
- Motivating women to get adequate amounts of folic acid daily.
- Informing women about reliable sources of synthetic folic acid.

2. Eat a fortified breakfast cereal daily which contains 100% of the recommended daily amount of folic acid (400 micrograms).

A few cereals have enough added folic acid per serving to meet 100% of a woman's daily need. Fortified breakfast cereals that contain 100% of the recommended daily amount of folic acid (e.g., Total®, Product 19®, Multi-Grain Cheerios Plus®, and Smart Start®) are good options for women who do not want to or cannot take a vitamin supplement.

3. Increase consumption of foods fortified with folic acid in addition to consuming food folate from a balanced diet.

Effective January 1, 1998, the U. S. Food and Drug Administration ordered that all enriched cereal or grain products be fortified at a level of 140 micrograms (0.14 milligram) of folic acid per 100 grams of grain product. While this level of fortification offers some protection against NTDs, most women will not get enough folic acid through fortified grain products alone.



In addition to getting 400 micrograms of synthetic folic acid, women should consume food folate from a variety of foods. Foods rich in folate include orange juice from concentrate, dark-green leafy vegetables (e.g., spinach, broccoli, asparagus, and romaine lettuce), beans, grains, citrus and other fruits (e.g., kiwis and strawberries), and liver. A list of foods that are good sources of folic acid and folate is provided in Appendix B. However, women capable of becoming pregnant who eat a healthy diet still need to take a vitamin supplement, eat a breakfast cereal containing 100% of the daily value of folic acid daily or increase their consumption of foods fortified with folic acid to achieve the recommended amount of folic acid for the prevention of NTDs.⁵

Very large amounts of folic acid may hide the ability to quickly diagnose a vitamin B₁₂ deficiency, a sign of pernicious anemia. This disease can lead to serious brain and nerve damage if not treated with vitamin B₁₂.

Pernicious anemia is rare in young and middle-aged people. Today, doctors can use a series of definitive tests to check individuals for a B₁₂ deficiency, even when large amounts of folic acid are present.

Can Women Get Too Much Folic Acid?

If a woman of reproductive age were to eat a bowl of fortified cereal (100 to 400 micrograms), take a vitamin containing 400 micrograms (0.4 milligram) of folic acid, and eat foods rich in folate in one day, she would not have a problem with too much folic acid. Even in very high amounts, folic acid is nontoxic.⁶ Nevertheless, with the exception of women who have had a prior NTD-affected pregnancy, it is recommended that women consume no more than 1,000 micrograms of synthetic folic acid a day.⁷ (See box).

What Do These Options Mean for Women?

A diet rich in food folate is healthy and highly recommended. There are a few studies that suggest food folate may reduce the risk for NTDs. However, this is still in question.⁸ The PHS recommendation for NTD prevention is based on studies of synthetic folic acid from supplements that women took in addition to their regular diets. Fortifying the food supply is an excellent way to increase consumption of folic acid without requiring women to change their behaviors. However, fortification at the 1998 level will not prevent all folic acid-preventable NTD-affected pregnancies unless women are educated to change the way they eat.

To prevent NTDs, women will need to take a folic acid-containing vitamin daily, eat a fortified breakfast cereal containing 100% of the daily value of folic acid, or increase their consumption of foods fortified with folic acid in addition to consuming food folate from a balanced diet.

Incorporating these behavior changes into women's lives will prevent a significant proportion of NTDs and also contribute to women's good health. To help answer frequently asked questions about folic acid that are not detailed in this introduction look in Appendix B. The next step is a guide for planning a successful NTD prevention campaign.

End Notes

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