



FOLIC ACID NOW

What are neural tube defects (NTDs)?

Between the 17th and 30th day after conception (or 4 to 6 weeks after the first day of a woman's last menstrual period), the neural tube forms in the embryo (developing baby) and then closes. The neural tube later becomes the baby's spinal cord, spine, brain, and skull. A neural tube defect (NTD) occurs when the neural tube fails to close properly, leaving the developing brain or spinal cord exposed to the amniotic fluid. The two most common neural tube defects are **anencephaly** and **spina bifida**.

What are spina bifida and anencephaly?

Spina bifida and anencephaly are birth defects that occur in the first four weeks of pregnancy, before most women know that they are pregnant. Because about half of all pregnancies are unplanned, it is important to include 400 micrograms of folic acid in every childbearing age woman's diet.

Spina bifida occurs when the lower end of the neural tube fails to close. Thus, the spinal cord and backbones do not develop properly. Sometimes, a sac of fluid protrudes through an opening in the back, and a portion of the spinal cord is often contained in this sac. Paralysis of the infant's legs, loss of bowel and bladder control, water on the brain (hydrocephalus), and learning disabilities are among the disabilities associated with spina bifida. Eighty to ninety percent of infants born with spina bifida live. Despite varying degrees of disability, many lead successful and productive lives.

Anencephaly is a fatal condition in which the upper end of the neural tube fails to close. In these cases, the brain either never completely develops or is totally absent. Pregnancies affected by anencephaly often result in miscarriages. Infants who are born alive die very soon after birth.

What is folic acid and where can I get it?

Folic acid is a B-vitamin. The recommended amount to prevent spina bifida and other neural tube defects is 400 micrograms (0.4 milligram) of synthetic folic acid daily. This can be consumed in three ways:

- Take a vitamin with 400 micrograms (0.4 mg) of folic acid every day. (Single folic acid pills are small and easy to swallow.) Both folic acid pills and multivitamins can be bought at grocery stores, pharmacies, or discount stores.

Or

- Eat a bowl of a breakfast cereal containing 100% of the daily value of folic acid per serving. *Total*, *Product 19*, *Cheerios Plus*, *Special K Plus* and *Smart Start* are some examples.

And

- Eat a healthy diet that contains lots of fruits and vegetables and foods fortified with folic acid. "Enriched" cereal grain products such as pasta, rice, bread, flour, and cereals have been fortified with certain amounts of folic acid. Foods containing folate include fruits; green, leafy vegetables; and dried beans and legumes.



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 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.**

Who can have a baby with a neural tube defect in the United States?

Sixty million women are of childbearing age in the United States; all those who are capable of becoming pregnant are at risk for having an NTD-affected pregnancy. It is not possible to predict which women will have a pregnancy affected by an NTD. Ninety-five percent of NTDs occur in women with no personal or family history of NTDs. However, some risk factors are known:

- An NTD-affected pregnancy increases a woman's chance to have another NTD-affected pregnancy approximately twenty times
- Maternal insulin-dependent diabetes
- Anti-seizure medication use
- Medically diagnosed obesity
- High temperatures in early pregnancy, prolonged fevers and hot tub use for example
- Race/ethnicity (NTDs are more common among white women than black women and more common among Hispanic women than non-Hispanic women)
- Lower socio-economic status

Can women get too much folic acid?

Folic acid has no known toxic level. If you were to eat a bowl of fully fortified cereal (400 micrograms), take 400 micrograms (0.4 milligram) folic acid supplement, and eat fortified foods and foods rich in folate, women of reproductive age would not have a problem with too much folic acid. Even in very high amounts folic acid is non-toxic. Nevertheless, it is recommended that women consume no more than 1,000 micrograms of synthetic folic acid a day. Large amounts of folic acid may hide the ability to quickly diagnose a rare vitamin B-12 deficiency, pernicious anemia. This condition primarily affects the elderly population and, in some cases, can lead to neurological damage. Today, doctors can use a simple definitive test to check for a B-12 deficiency.

Are women getting enough folic acid?

Even though there are several ways to get 400 micrograms (0.4 milligram) of folic acid every day, two thirds of women in the United States do not consume adequate amounts of folic acid.

What are the costs associated with NTDs?

The average total lifetime cost to society for each infant born with spina bifida is approximately \$532,000 per child. This estimate is only an average, and for many children the total cost may be well above \$1,000,000.

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What are other health benefits to taking folic acid?

High levels of the amino acid homocysteine are independently associated with an increased risk of heart disease and stroke. It has been shown that taking folic acid lowers homocysteine levels in both men and women, but it is not yet known whether folic acid supplementation also lowers the risk of heart disease and stroke. There are some indications that folic acid use may also reduce the risk for other birth defects, such as cleft lip and palate and certain congenital heart defects. Folic acid may also play a role in protecting against some forms of cancer and heart disease. More research is needed to understand the impact of folic acid in preventing those diseases and other birth defects.

To learn more about the national folic acid education campaign, call 1-888-232-5929 or visit our Web site at www.cdc.gov/ncbddd/folicacid

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