HEALTH BASICS

Folic acid and birth defect prevention

Folic acid taken around conception helps prevent serious defects of a developing baby's brain and spine.

WHAT IT IS
A B vitamin supplement used around conception and early pregnancy

WHERE IT COMES UP
Pregnancy planning, prenatal care, supplements, and fortified food labels

WHY IT MATTERS
Lowers the chance of serious neural tube defects

WHAT IT IS NOT
Not a disease or a guarantee against birth defects

WHO TO ASK
Pharmacist, primary care clinician, midwife, or obstetric clinician

HOW IT IS CHECKED
Usually no test; blood folate testing for selected concerns

Overview

Folic acid is a form of folate, also called vitamin B9. Folate occurs naturally in foods such as leafy vegetables, beans, peas, and citrus fruits. Folic acid is used in supplements and added to some fortified foods.

Taking folic acid before conception and during early pregnancy lowers the chance of neural tube defects. These are serious birth defects affecting the developing brain, spine, or spinal cord.

This topic is not a disease or diagnosis. Folic acid does not prevent every birth defect, and needing it does not mean that anything is wrong with you or a pregnancy.

The timing matters. The neural tube develops and closes during the first few weeks after conception, often before someone knows they are pregnant. For this reason, public health guidance commonly recommends folic acid for people who could become pregnant, not only after a pregnancy is confirmed.

In the United States, recommendations for people at average risk generally call for 400 to 800 micrograms, or 0.4 to 0.8 milligrams, of folic acid each day. Guidance in other countries may use a specific dose within this range. Some people need a higher prescribed dose because of

their medical or pregnancy history.

How it works

Folate helps cells make DNA and divide normally. These processes happen rapidly as an embryo begins to develop.

Early in pregnancy, a flat layer of cells folds into a structure called the neural tube. This tube later forms the brain and spinal cord. If it does not close completely, a neural tube defect can develop.

Folic acid taken before conception helps ensure that enough folate is available during this short stage. Starting after a positive pregnancy test may still be useful, but it may miss part or all of the period when the neural tube closes.

Folic acid is the form proven to help prevent neural tube defects. Other forms of folate, including products labelled methylfolate or 5-MTHF, have not been studied as extensively for this purpose. A supplement label may list total folate in "micrograms DFE," or dietary folate equivalents, with the amount of folic acid shown separately.

Food fortification increases folic acid intake across the population. Even where flour or cereals are fortified, pregnancy guidance may still recommend a daily supplement.

Why it matters for your health

The main reason to take folic acid around conception is to reduce the chance of neural tube defects.

These conditions include:

Folic acid lowers risk but cannot remove it completely. Neural tube defects can have several causes, including genetic and environmental factors that are not controlled by taking a supplement.

Folic acid also supports normal blood cell production. However, the pregnancy recommendation is intended to provide folic acid at the correct time, rather than to treat symptoms or a known deficiency.

A blood folate test is not routinely needed before taking the usual recommended amount. Blood testing may be used when a clinician suspects poor absorption, malnutrition, or a type of anaemia. It cannot confirm that a fetal neural tube has closed normally.

Prenatal screening is separate from folic acid use. Depending on where you live and your stage

of pregnancy, screening may include blood tests and an ultrasound. These tests look for signs of certain fetal conditions; they do not measure whether folic acid "worked."

- Spina bifida , in which part of the spine and spinal cord does not develop normally
- Anencephaly , in which major parts of the brain and skull do not develop
- Encephalocele , in which brain tissue and its coverings extend through an opening in the skull

What can go wrong

The most important problem is starting too late. Taking folic acid only after pregnancy is confirmed may not provide enough folate during the earliest development of the neural tube. This is why starting before conception is advised when possible.

Some people have a higher chance of a neural tube defect and may need different advice. Relevant situations can include:

Do not stop or change a prescription medicine because of concerns about folate or pregnancy. The risks of changing treatment can be significant. A prescriber can review the medicine and decide whether a different folic acid dose or treatment plan is appropriate.

Taking several supplements together can lead to an unintended high dose. Large amounts of folic acid can make the blood signs of vitamin B12 deficiency harder to detect while nerve damage continues. Clinician-prescribed higher doses have specific uses, but they should not be started by simply combining multiple products.

Common variants of the MTHFR gene are sometimes blamed for poor folate processing. Current public health guidance does not recommend avoiding folic acid because of a common MTHFR variant. People with these variants can process folic acid, and routine genetic testing is not needed to choose a standard supplement.

Missing a tablet or beginning later than planned is not an emergency. Take the next dose according to the product instructions rather than doubling it unless a clinician has told you otherwise.

A serious allergic reaction to a supplement is uncommon. Breathing difficulty, faintness, or swelling of the face, tongue, or throat after taking one requires emergency help.

- A previous pregnancy affected by a neural tube defect
- A neural tube defect in you, the other biological parent, or a close family member
- Diabetes

- Conditions or surgery that reduce nutrient absorption
- Use of certain anti-seizure or other prescription medicines

What you can do

If you could become pregnant, are planning pregnancy, or have recently become pregnant, check whether your supplement contains folic acid. A prenatal vitamin often includes it, but the amount and form should be confirmed on the label.

Practical steps include:

If pregnancy was not planned, start the recommended supplement once you know you are pregnant and arrange routine prenatal care. Starting late does not mean that a birth defect has occurred.

There is usually no folate test you need to request. A clinician may order blood tests if your diet, medical history, symptoms, or medicines suggest deficiency or poor absorption.

Questions about dose, missed supplements, prescription medicines, or a previous affected pregnancy belong in routine preconception or prenatal care. An abnormal prenatal screening result needs timely follow-up with the service that arranged the test, but it is not usually an emergency by itself.

- Ask a pharmacist or pregnancy-care clinician whether the standard local dose applies to you
- Start at least one month before conception when pregnancy is planned
- Continue through early pregnancy, following local prenatal guidance
- Record the names and amounts of all vitamins, supplements, and medicines
- Avoid stacking a prenatal vitamin with separate folic acid unless advised
- Ask about a higher prescribed dose before conception if you have added risk factors

Common questions

Can food provide enough folate?

Folate-rich foods are valuable during pregnancy, but food intake can change from day to day. The amount absorbed also differs by food and preparation. Public health recommendations therefore specify folic acid from a supplement, fortified food, or both rather than relying only on naturally occurring folate.

Is it too late if I am already pregnant?

No. Start folic acid as soon as practical and arrange routine prenatal care. It may be too late to cover the whole period of neural tube closure, but folate remains important for cell and blood development.

Does folic acid prevent all birth defects?

No. It specifically lowers the chance of neural tube defects. It does not guarantee that a pregnancy will be unaffected by these or other conditions.

Do I need a special form because of an MTHFR result?

Usually not. Common MTHFR variants are not a reason to avoid folic acid. If genetic testing was ordered because of a specific medical concern, discuss the result with the clinician who requested it.

Should I take a higher dose for extra protection?

Not without clinical advice. Higher doses are recommended in some higher-risk situations, but more is not automatically better. Your pregnancy history, health conditions, medicines, and local guidance determine whether a prescribed dose is appropriate.

Do folic acid tablets replace prenatal screening?

No. Supplements reduce risk, while prenatal screening looks for signs of certain conditions. Continue with the screening and ultrasound schedule offered during pregnancy.

Sources

- US Preventive Services Task Force. Folic Acid Supplementation to Prevent Neural Tube Defects: Preventive Medication . JAMA. 2023;330(5):454-459.
- Centers for Disease Control and Prevention. About Folic Acid . National Center on Birth Defects and Developmental Disabilities.
- Centers for Disease Control and Prevention. MTHFR Gene Variant and Folic Acid Facts . National Center on Birth Defects and Developmental Disabilities.
- National Institutes of Health, Office of Dietary Supplements. Folate: Fact Sheet for Health Professionals .
- American College of Obstetricians and Gynecologists. Nutrition During Pregnancy . Frequently Asked Questions.



- De-Regil LM, Peña-Rosas JP, Fernández-Gaxiola AC, Rayco-Solon P. Effects and Safety of Periconceptional Oral Folate Supplementation for Preventing Birth Defects . Cochrane Database of Systematic Reviews. 2015;12:CD007950.