CONDITION

Folate deficiency

Folate deficiency means the body lacks enough folate to make healthy cells and red blood cells.

WHAT IT IS
Too little folate for normal cell and blood production

BODY SYSTEM
Blood and developing nervous system

MAIN SYMPTOMS
Tiredness, weakness, breathlessness, sore tongue

WHAT CAUSES IT
Low intake, poor absorption, increased need, or certain medicines

HOW IT IS DIAGNOSED
Blood count, serum folate, and vitamin B12 tests

MAIN TREATMENT
Folic acid replacement and treatment of the underlying cause

CAN IT BE CURED?
Yes - with replacement and cause treatment

IS IT AN EMERGENCY?
Sometimes - with chest pain, fainting, or severe breathlessness

LONG-TERM OUTLOOK
Usually full recovery; recurrence possible if the cause persists

Overview

Folate deficiency means that your body does not have enough folate, also called vitamin B9. Folate is needed to make DNA, the genetic material inside cells. It is especially important in tissues that constantly produce new cells, including bone marrow, skin, and the lining of the digestive system.

Your bone marrow uses folate to make red blood cells. If folate remains low, it can produce unusually large red blood cells that do not work normally. This is called megaloblastic anaemia. Anaemia means there are not enough healthy red blood cells to carry oxygen around the body.

Folate is the natural form found in food. Folic acid is the manufactured form used in supplements, medicines, and fortified foods.

The deficiency is usually treatable. However, it is important to find out why it developed. Causes include a limited diet, difficulty absorbing nutrients, increased needs during pregnancy, heavy alcohol use, and some medicines. Vitamin B12 deficiency can produce a similar type of anaemia and may occur at the same time.

Symptoms

Mild folate deficiency may not cause noticeable symptoms. Symptoms often appear gradually as anaemia develops.

Possible symptoms include:

These symptoms are not specific to folate deficiency. Many other conditions can cause them, so a blood test is needed rather than relying on symptoms alone.

Numbness, pins and needles, balance problems, or changes in memory are more strongly associated with vitamin B12 deficiency than folate deficiency. Seek medical assessment if you develop these symptoms because untreated B12 deficiency can injure nerves.

- Ongoing tiredness or reduced energy
- Weakness, dizziness, or headaches
- Shortness of breath during normal activity
- A fast or noticeable heartbeat
- Pale skin, although this may be harder to see on some skin tones
- A red, smooth, or painful tongue
- Mouth ulcers
- Reduced appetite or indigestion

Causes and risk factors

The body stores only a limited supply of folate. Deficiency may develop when intake is low, absorption is poor, or the body needs more than usual.

A diet may provide too little folate if it contains few vegetables, beans, fruit, or fortified grain products. Restrictive eating, food insecurity, loss of appetite, and frailty can increase this risk. Heavy alcohol use can reduce intake, interfere with absorption, and affect how the body processes folate.

Conditions affecting the small intestine may prevent folate from being absorbed properly. These include coeliac disease, inflammatory bowel disease, and some forms of intestinal surgery. Persistent diarrhoea may also contribute.

Folate requirements rise during pregnancy because new tissues are developing quickly. Needs may also increase with long-term breakdown of red blood cells, certain cancers, severe skin conditions, or kidney dialysis.

Some medicines interfere with folate absorption or metabolism. Examples include methotrexate, trimethoprim, sulfasalazine, and certain anti-seizure medicines. These medicines have important uses, and you should not stop or change them without medical advice. In some situations, folic acid or another form of folate is deliberately prescribed alongside treatment.

Older age alone does not cause folate deficiency, but illness, reduced appetite, alcohol use, or several medicines may make it more likely.

Diagnosis

Diagnosis starts with your symptoms, diet, medical history, alcohol use, and medicines. Blood tests are then used to look for deficiency and its effects.

A full blood count measures red blood cells and haemoglobin, the protein that carries oxygen. Folate deficiency may cause low haemoglobin and red blood cells that are larger than usual. However, not everyone has this typical pattern, particularly early in the deficiency or when another condition is also present.

A serum folate test measures folate in the liquid part of the blood. A low result, considered alongside other findings, supports the diagnosis. Recent meals or supplements can affect this measurement. Testing folate stored inside red blood cells is not routinely needed in every case.

Vitamin B12 is usually checked as well because its deficiency can look similar. Other tests may examine iron levels, liver function, thyroid function, coeliac disease, or signs of increased red blood cell breakdown.

If you have already started a folic acid supplement, tell the healthcare professional arranging your tests. Supplementation can change the folate result and may make the original deficiency harder to confirm.

Treatment and management

Treatment usually involves replacing folate with folic acid. The form, amount, and length of treatment are chosen according to the severity and cause of the deficiency. Treatment may continue longer when an ongoing condition or medicine keeps folate levels low.

Vitamin B12 deficiency should be assessed before folic acid is used on its own. Folic acid can improve the anaemia caused by B12 deficiency without treating associated nerve damage. If both nutrients are low, both deficiencies need appropriate treatment.

Management also addresses the cause. This may include treating coeliac disease or another digestive condition, improving nutrition, or reviewing a medicine that affects folate. Do not stop a prescribed medicine without discussing it with the prescriber.

Foods that provide folate include leafy green vegetables, beans, peas, lentils, broccoli, asparagus, oranges, and some fortified breads and cereals. Food can support recovery, but diet alone may not be enough once a clear deficiency or anaemia has developed.

Follow-up commonly includes a review of symptoms and another blood count to confirm that red blood cell production is recovering. Further investigation may be needed if the blood count does not improve as expected.

Complications

Untreated deficiency can lead to worsening anaemia. Severe anaemia makes the heart work harder and may cause marked breathlessness, dizziness, chest discomfort, or fainting. This is uncommon when the condition is found and treated promptly.

Folate is important during the earliest stages of pregnancy. Too little folate around conception and early pregnancy increases the risk of neural tube defects, which affect development of the baby's brain and spinal cord.

A major treatment concern is hidden vitamin B12 deficiency. Folic acid may correct the abnormal blood count while B12-related nerve injury continues. This is why B12 testing and a full assessment matter.

Complications are more likely when the cause continues, treatment is delayed, or another deficiency is present.

Prevention

Some cases can be prevented, but not all. Folate deficiency caused by an ongoing absorption problem, increased medical need, or an essential medicine may recur despite a balanced diet.

Eating regular sources of folate can reduce the risk of dietary deficiency. Fortified foods may also contribute, depending on the country and food product. Alcohol reduction may help when alcohol is affecting nutrition or absorption.

People who could become pregnant are generally advised to take folic acid before conception and during early pregnancy because food alone may not provide the recommended amount. The appropriate supplement can differ for people with certain medicines, health conditions, or previous pregnancies affected by a neural tube defect. Follow the pregnancy guidance used in your country.

If you have a condition or treatment that affects folate, planned blood tests or preventive supplementation may be appropriate. This should be based on your individual medical situation rather than self-treating with high-dose supplements.

Living with it and what to expect

Many people begin to feel better after folate replacement and treatment of the cause, although improvement is not immediate. The bone marrow needs time to produce healthy red blood cells. Energy and breathlessness may improve gradually as the blood count recovers.

A temporary cause, such as a short period of poor intake, may not require long-term treatment once folate stores and diet have recovered. Deficiency can return if poor absorption, heavy alcohol use, increased folate needs, or a folate-blocking medicine continues.

Ongoing tiredness after the blood count has normalised may have another cause. Iron deficiency, vitamin B12 deficiency, thyroid conditions, sleep problems, and other illnesses can produce similar symptoms.

Most people can continue their usual activities, adjusting for tiredness while anaemia improves. Routine follow-up is used to check recovery and decide whether further testing or longer treatment is needed.

When to get medical help

Arrange a routine appointment if you have persistent tiredness, unexplained weakness, a sore tongue, repeated mouth ulcers, or breathlessness during activities that were previously comfortable. Assessment is also appropriate if you have risk factors such as coeliac disease, bowel surgery, heavy alcohol use, a restricted diet, or a medicine that affects folate.

Seek prompt medical advice if you are pregnant or planning pregnancy and think you may be folate deficient. Also request timely assessment for numbness, pins and needles, problems

with balance, confusion, or memory changes because these can suggest vitamin B12 deficiency or another neurological condition.

Seek urgent or emergency help for:

These symptoms do not automatically mean folate deficiency, but they can occur with severe anaemia or another condition needing urgent assessment.

- Severe difficulty breathing or breathlessness at rest
- Chest pain
- Fainting or near-fainting
- A very fast heartbeat with weakness or dizziness
- New confusion or severe difficulty staying awake

Common questions

Is folate deficiency the same as folic acid deficiency?

They refer to the same vitamin shortage, but the words describe different forms. Folate occurs naturally in food. Folic acid is the form commonly used in supplements, medicines, and fortified foods.

How long does it take to recover from folate deficiency?

Blood cell production can begin responding soon after effective treatment, but symptoms may take several weeks to improve. Recovery time is affected by how severe the anaemia is, whether the cause continues, and whether another deficiency or illness is present.

What foods are high in folate?

Good sources include leafy green vegetables, lentils, beans, peas, broccoli, asparagus, oranges, and fortified grain products. Cooking can reduce the folate content of some foods. A diagnosed deficiency may still require supplementation rather than dietary changes alone.

Why must vitamin B12 be checked before taking folic acid?

Folic acid can improve the anaemia caused by vitamin B12 deficiency without preventing ongoing nerve damage. Checking for B12 deficiency helps make sure both problems are recognised and treated.

Can folate deficiency come back?

Yes. It may return if the underlying reason remains, such as poor absorption, heavy alcohol use, increased folate needs, or a medicine that interferes with folate. Some people need longer treatment or periodic monitoring.

Does folate deficiency cause weight gain?

Weight gain is not a typical direct effect. Reduced appetite and weight loss may occur in some people, but weight changes have many possible causes and should not be attributed to folate deficiency without assessment.

Sources

- National Institutes of Health Office of Dietary Supplements. Folate: Fact Sheet for Health Professionals
- NHS. Vitamin B12 or folate deficiency anaemia
- Devalia V, Hamilton MS, Molloy AM. Guidelines for the diagnosis and treatment of cobalamin and folate disorders . British Journal of Haematology . 2014;166:496-513
- World Health Organization. Guideline: Optimal serum and red blood cell folate concentrations in women of reproductive age for prevention of neural tube defects . 2015
- Centers for Disease Control and Prevention. About folic acid