

## Folic acid and iron requirements during pregnancy



### Why folic acid matters before and during pregnancy

Folate is a B vitamin needed for DNA synthesis, cell division, and red blood cell production. In pregnancy, these functions become especially important because the embryo, placenta, uterus, and maternal blood volume are all growing rapidly. Folic acid is the synthetic form used in most supplements and fortified foods; it is well absorbed and has been studied extensively in relation to neural tube defect prevention.

The neural tube develops into the brain and spinal cord. It closes very early, typically within the first month after conception, which is why folic acid is ideally started before pregnancy. The World Health Organization notes that folic acid should ideally begin before conception to reduce the risk of neural tube defects. ACOG similarly recommends starting a prenatal vitamin with at least 400 micrograms of folic acid at least one month before pregnancy when possible and continuing through the first 12 weeks.

This timing can be emotionally difficult for people with unplanned pregnancies, irregular cycles, fertility treatment uncertainty, or limited access to preconception care. If supplementation was not started before conception, it is still worth discussing folic acid and prenatal vitamins promptly with a

healthcare professional. Starting late is not a reason for guilt; it is a reason for supportive, practical care.

### **Folic acid requirements: routine and higher-risk situations**

For routine pregnancy nutrition, ACOG states that pregnant people need 600 micrograms of folic acid daily and recommends a prenatal vitamin containing at least 400 micrograms. The NHS recommends a daily 400 microgram folic acid supplement from before conception until 12 weeks of pregnancy. WHO recommends 400 micrograms of folic acid daily as part of daily antenatal iron and folic acid supplementation.

These numbers can appear inconsistent, but they are usually addressing related yet slightly different concepts: supplemental folic acid, total folate intake from food plus supplements, and public health supplementation protocols. In practice, many prenatal vitamins provide at least 400 micrograms of folic acid, while diet contributes additional folate from foods such as leafy greens, legumes, citrus fruits, asparagus, avocado, and fortified grains.

Some people are advised to take higher-dose folic acid, particularly if they have an increased risk of neural tube defects. The NHS notes that higher-dose folic acid may be recommended for people at increased risk. Examples can include a previous pregnancy affected by a neural tube defect, certain antiseizure medications, diabetes, malabsorption conditions, or other clinical factors. Because higher-dose folic acid can interact with broader medical assessment, including vitamin B12 status and medication review, it should be taken under clinician guidance.

### **Why iron needs rise in pregnancy**

Iron is essential for hemoglobin, the oxygen-carrying protein in red blood cells, and for many enzymes involved in cellular metabolism. Pregnancy increases iron requirements for several overlapping reasons: maternal red cell mass expands, the placenta requires iron-containing proteins, the fetus accumulates iron stores for early infancy, and blood loss at delivery must be physiologically anticipated.

When intake or stores are insufficient, iron deficiency can develop, sometimes

progressing to iron-deficiency anemia. Anemia can contribute to fatigue, reduced exercise tolerance, dizziness, palpitations, shortness of breath with exertion, restless legs, impaired concentration, and, in more severe cases, clinically significant maternal or fetal risk. However, these symptoms are not specific to iron deficiency; pregnancy itself, thyroid disease, infection, cardiopulmonary issues, vitamin B12 deficiency, folate deficiency, and other conditions can overlap. Testing and interpretation by a healthcare professional are important.

WHO's recommendation for daily iron and folic acid supplementation in pregnancy is intended to help prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth. ACOG states that pregnant women need 27 mg of iron per day. In some settings or for some individuals, clinicians may recommend more intensive iron replacement, but the dose, formulation, and monitoring should be individualized.

### **Iron requirements and supplement dosing in context**

Iron supplement labels can be confusing because they may list either the salt form, such as ferrous sulfate, ferrous fumarate, or ferrous gluconate, or the amount of elemental iron. Elemental iron is the amount that matters physiologically. WHO recommends 30 to 60 mg of elemental iron plus 400 micrograms of folic acid daily for pregnant women in antenatal supplementation programs. ACOG's dietary requirement figure is 27 mg of iron per day.

Many prenatal vitamins contain iron, often near the 27 mg range, but formulations vary. Some gummy prenatal vitamins contain little or no iron. People who follow vegetarian or vegan diets, have heavy menstrual bleeding before pregnancy, carry multiples, have closely spaced pregnancies, have inflammatory bowel disease or bariatric surgery history, or enter pregnancy with low ferritin may need closer assessment.

Too much iron can cause nausea, constipation, abdominal pain, dark stools, and, in excessive amounts, toxicity. It can also complicate some medical conditions, such as iron overload disorders. For that reason, it is sensible to avoid stacking multiple iron-containing products unless a clinician has recommended it. A prenatal vitamin, an additional iron tablet, fortified foods, and other supplements can add up quickly.

## **Food sources: building a folate- and iron-supportive diet**

Supplements are often recommended because requirements are high and timing is critical, but food remains a meaningful part of pregnancy nutrition.

Folate-rich foods include dark leafy greens, broccoli, Brussels sprouts, beans, lentils, peas, oranges, fortified cereals, and enriched grain products. These foods also contribute fiber and other micronutrients, which may help with constipation and overall dietary quality.

Iron comes in two main dietary forms. Heme iron, found in animal foods, is generally more efficiently absorbed. Sources include lean red meat, poultry, and fish that are safe in pregnancy according to local guidance. Non-heme iron is found in beans, lentils, tofu, spinach, nuts, seeds, fortified cereals, and whole grains. Non-heme iron absorption varies more and is influenced by the rest of the meal.

Pair plant-based iron foods with vitamin C-rich foods such as citrus, strawberries, kiwi, tomatoes, bell peppers, or potatoes to improve absorption. Avoid taking iron supplements at the same time as calcium supplements, high-calcium meals, tea, or coffee if your clinician advises separation, because these can reduce absorption.

If iron causes nausea, ask about timing, formulation, dose adjustment, or alternate strategies rather than stopping without advice.

Maintain a broader dietary pattern that includes adequate protein, energy, and other micronutrients; iron and folate do not work in isolation.

## **Side effects, tolerability, and practical strategies**

Folic acid at routine doses is usually well tolerated. Iron is more likely to cause gastrointestinal side effects. Constipation, nausea, metallic taste, abdominal discomfort, and dark stools are common reasons people struggle with adherence. This is not a personal failure; it is a predictable pharmacologic issue, and clinicians have several ways to help.

Practical approaches may include taking iron with a small amount of food if nausea is problematic, using a stool-softening or constipation plan recommended by a clinician, changing the iron salt formulation, adjusting timing, or

assessing whether the current dose is necessary. Some people require laboratory monitoring with hemoglobin, hematocrit, mean corpuscular volume, ferritin, or other studies depending on the clinical picture.

Do not assume that more iron is always better. If fatigue is severe or anemia is suspected, the safest next step is medical evaluation rather than simply increasing supplements. The same principle applies to folic acid: routine supplementation is widely recommended, but higher-dose regimens should be targeted to specific risk factors.

### **Individualized care: when standard prenatal vitamins may not be enough**

Standard prenatal vitamins are designed for broad coverage, not for every possible medical circumstance. Some people need specialized planning before conception or early in pregnancy. This may include people taking antiseizure medications, people with diabetes, prior neural tube defect-affected pregnancy, malabsorption syndromes, bariatric surgery history, severe nausea and vomiting, eating disorders, restrictive diets, multifetal gestation, chronic kidney disease, hemoglobinopathies, or documented iron deficiency.

A careful review of medications and supplements is especially important because some drugs can affect folate metabolism, while some supplements can duplicate nutrients. Prenatal nutrition also intersects with screening: early pregnancy blood tests often include a complete blood count, and additional testing may be ordered based on history, diet, symptoms, or prior anemia.

If you are planning pregnancy, preconception counseling can be very helpful. If you are already pregnant, bring all supplement bottles to an antenatal visit or send photos of the labels to your clinician if that is acceptable in your care system. The goal is not perfection; it is clear, individualized, compassionate care.