CONDITION

Pernicious anemia

Pernicious anemia is vitamin B12 deficiency caused by an autoimmune problem that prevents normal absorption from food.

WHAT IT IS
Vitamin B12 deficiency from failed intrinsic-factor absorption

BODY SYSTEM
Blood, digestive system, and nervous system

MAIN SYMPTOMS
Fatigue, breathlessness, numbness, balance problems

WHAT CAUSES IT
Autoimmune damage to stomach cells making intrinsic factor

HOW IT IS DIAGNOSED
Blood count, vitamin B12 markers, intrinsic factor antibodies

MAIN TREATMENT
Lifelong vitamin B12 replacement

CAN IT BE CURED?
No - autoimmune absorption problem usually persists

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

LONG-TERM OUTLOOK
Usually good with lifelong replacement and monitoring

Overview

Pernicious anemia is a type of vitamin B12 deficiency. It happens when an autoimmune process affects the stomach and prevents vitamin B12 from being absorbed normally.

Vitamin B12 is needed to make healthy red blood cells and maintain the nervous system. Red blood cells carry oxygen around your body. When you do not have enough B12, the cells may become unusually large and fail to work properly, causing anemia.

Normally, stomach cells make a protein called intrinsic factor. This protein attaches to vitamin B12 from food and helps the small intestine absorb it. In pernicious anemia, the immune system mistakenly targets intrinsic factor or the stomach cells that produce it.

The underlying stomach condition is often called autoimmune gastritis. "Gastritis" means

inflammation of the stomach lining. The autoimmune problem usually continues throughout life, but vitamin B12 replacement can correct the deficiency and prevent further harm.

Not every vitamin B12 deficiency is pernicious anemia. Other causes include certain medicines, stomach or intestinal surgery, dietary deficiency, and conditions affecting the small intestine.

Symptoms

Symptoms often develop slowly because the body can store vitamin B12 for several years. Early symptoms may be mild or mistaken for stress, aging, or another condition.

Symptoms related to anemia can include:

Vitamin B12 deficiency can also affect the nerves and brain. You may notice pins and needles, numbness, burning sensations, muscle weakness, poor balance, or difficulty walking. Some people have problems with memory, concentration, mood, or vision.

Other possible symptoms include a sore, smooth tongue, mouth ulcers, reduced appetite, indigestion, diarrhea, or unintentional weight loss.

Nerve symptoms can occur even when a blood count does not show anemia. Symptoms alone cannot confirm pernicious anemia because many other conditions can cause similar problems.

- Tiredness, weakness, or reduced stamina
- Shortness of breath during activity
- Dizziness, headaches, or feeling faint
- A fast or noticeable heartbeat
- Pale skin

Causes and risk factors

Pernicious anemia results from an autoimmune reaction. The immune system normally protects you from infection. In this condition, it attacks parts of the stomach lining or makes antibodies against intrinsic factor.

This reduces both intrinsic factor and, often, stomach acid. Without enough intrinsic factor, the small intestine cannot absorb vitamin B12 efficiently, even when your diet contains plenty of it.

The exact reason this autoimmune reaction begins is not fully understood. Genetic susceptibility may contribute, so the condition can occur in more than one family member. However, it is not inherited in a simple or predictable way.

Pernicious anemia becomes more likely with age, although younger people can develop it. It is also associated with other autoimmune conditions, particularly autoimmune thyroid conditions, type 1 diabetes, vitiligo, and Addison's disease.

Previous stomach surgery can also cause loss of intrinsic factor, but vitamin B12 deficiency after surgery is not always classified as pernicious anemia. A clinician will consider the exact cause because this may affect follow-up.

Diagnosis

Diagnosis usually begins with a discussion of your symptoms, medical history, diet, medicines, previous surgery, and family history. A physical examination may check skin color, heart rate, sensation, reflexes, strength, and balance.

Blood tests may include:

Intrinsic factor antibodies strongly support pernicious anemia when they are present. However, some people with the condition do not have a positive test. Antibodies against stomach parietal cells may provide additional information, but they are less specific and can occur in people without pernicious anemia.

Vitamin B12 results are not always straightforward. Supplements, recent injections, pregnancy, kidney problems, and some laboratory methods can affect interpretation. A clinician may consider several results together rather than relying on one number.

If significant nerve symptoms are present, treatment may begin while test results are pending. Taking blood samples before treatment is useful when this can be done safely, because replacement can change later results.

Some people are referred for a camera examination of the stomach, called an upper endoscopy. This can confirm autoimmune gastritis, check for other stomach problems, and help plan longer-term monitoring. It is not required in every situation.

- A complete blood count to look for anemia and unusually large red blood cells
- A vitamin B12 level or an active B12 test
- Methylmalonic acid, which often rises when cells lack vitamin B12
- Folate, iron, and thyroid tests to look for related or alternative problems
- Antibodies against intrinsic factor

Treatment and management

Treatment replaces the vitamin B12 that your body cannot absorb normally. For confirmed or suspected autoimmune gastritis, this usually means regular vitamin B12 injections into a muscle. The form of B12 used differs between countries.

Replacement is generally lifelong because it controls the deficiency but does not restore intrinsic factor. Treatment may be more frequent at first, particularly when there are nerve symptoms, and less frequent once body stores have been restored. The exact schedule is based on the preparation used, symptoms, and clinical response.

High-strength oral vitamin B12 can be appropriate in some forms of deficiency because a small amount can be absorbed without intrinsic factor. For pernicious anemia, injections are commonly preferred to provide reliable replacement. Any change between injections and tablets should be planned with the healthcare professional managing your care.

Dietary changes alone cannot correct the absorption problem. Foods containing B12, such as meat, fish, eggs, dairy products, and fortified foods, can support general nutrition but do not replace medical treatment.

Follow-up may include a review of symptoms and repeat blood tests. Blood counts often improve before nerve symptoms. If the response is slower than expected, other causes such as iron or folate deficiency may need to be considered.

Complications

Untreated deficiency can cause worsening anemia. Severe anemia places extra strain on the heart and may lead to marked breathlessness, chest discomfort, or fainting.

Long-standing vitamin B12 deficiency may damage nerves. Numbness, weakness, balance problems, or cognitive changes may become permanent if treatment is delayed, although many people improve after replacement begins.

Autoimmune gastritis can also reduce iron absorption. Iron deficiency may appear before, alongside, or after vitamin B12 deficiency.

People with autoimmune gastritis have a higher risk of certain stomach growths, including stomach cancer and type 1 gastric neuroendocrine tumors. These outcomes are still uncommon, and the need for endoscopy or ongoing stomach monitoring is based on individual findings and specialist assessment.

Vitamin B12 treatment corrects the deficiency, but it does not remove the stomach-related risk. This is why appropriate follow-up remains useful even after blood results improve.

Prevention

There is no established way to prevent the autoimmune process that causes pernicious anemia.

Eating enough vitamin B12 cannot prevent deficiency when intrinsic factor is missing. Once the condition is recognized, staying on replacement treatment and attending planned follow-up can prevent the deficiency from returning and reduce the risk of complications.

Relatives do not usually need testing unless they have symptoms or another reason to suspect vitamin B12 deficiency.

Living with it and what to expect

Most people can lead their usual lives once vitamin B12 has been replaced. Energy, breathlessness, and blood counts often improve over weeks to months. Nerve symptoms may take longer and do not always disappear completely, especially if they were present for a long time.

The autoimmune stomach changes usually remain. Treatment therefore becomes part of long-term care rather than a short course. Missing one appointment does not usually cause an immediate crisis, but repeated missed injections can allow deficiency and symptoms to return.

Keep a record of your treatment, especially if you move, travel for long periods, or change healthcare services. Tell new healthcare professionals that your B12 deficiency is caused by an absorption problem rather than diet alone.

Routine follow-up may review returning symptoms, treatment timing, iron levels, and other autoimmune conditions. Some people also need stomach assessment or surveillance based on endoscopy findings and personal risk.

New symptoms should not automatically be blamed on pernicious anemia. Persistent tiredness, numbness, or digestive symptoms may have another cause and deserve review.

When to get medical help

Arrange a routine medical appointment if you develop ongoing tiredness, breathlessness with ordinary activity, pins and needles, numbness, a sore tongue, memory changes, or unexplained balance problems. Earlier assessment is especially important if symptoms are progressing.

If you already receive treatment, request a review if symptoms return before injections, do not

improve as expected, or if appointments have been missed. Persistent indigestion, swallowing difficulty, vomiting, black stools, or unintentional weight loss also need timely assessment.

Seek urgent medical care for rapidly worsening weakness, new difficulty walking, severe breathlessness, fainting, or a very fast heartbeat.

Call emergency services for chest pain, severe difficulty breathing, loss of consciousness, or sudden one-sided weakness, facial drooping, or trouble speaking. These symptoms can have causes other than pernicious anemia and need immediate assessment.

Common questions

Is pernicious anemia the same as vitamin B12 deficiency?

It is one cause of vitamin B12 deficiency. Pernicious anemia specifically involves loss of normal B12 absorption because of intrinsic-factor deficiency, usually from autoimmune gastritis. Diet, medicines, surgery, and intestinal conditions can cause B12 deficiency in other ways.

Can I treat pernicious anemia with food?

No. Food cannot correct the lack of intrinsic factor. Even a diet rich in vitamin B12 may not provide enough absorbable B12. Medical replacement, usually by injection, bypasses this problem.

Will I need vitamin B12 treatment for life?

Usually, yes. The autoimmune process and loss of intrinsic factor generally persist. Stopping replacement can allow body stores to fall again, although symptoms may take time to return.

How quickly will I feel better?

Blood production and some symptoms may begin improving after treatment starts, but recovery time differs. Tiredness may improve over several weeks. Numbness, weakness, or balance problems can take months and may not fully resolve after prolonged deficiency.

Is pernicious anemia hereditary?

It can run in families, but it is not passed down in a simple pattern. Having an affected relative may increase susceptibility without meaning that you will develop it.

Is pernicious anemia a type of cancer?

No. It is an autoimmune condition that causes vitamin B12 malabsorption. The associated autoimmune gastritis does increase the risk of some stomach tumors, which is why stomach assessment may be considered separately.

Sources

- National Institute for Health and Care Excellence: Vitamin B12 deficiency in over 16s-diagnosis and management, NICE guideline NG239 , 2024
- NHS: Vitamin B12 or folate deficiency anaemia
- National Institutes of Health Office of Dietary Supplements: Vitamin B12 fact sheet for health professionals
- American Gastroenterological Association: Clinical Practice Update on the Diagnosis and Management of Atrophic Gastritis , Gastroenterology , 2021
- British Society of Gastroenterology: Guidelines on the diagnosis and management of patients at risk of gastric adenocarcinoma , Gut , 2019