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Pernicious Anemia

(Vitamin B12 Deficiency, Addison's Anemia, Congenital Pernicious Anemia)

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The Facts

The blood that circulates throughout the body performs a number of critical functions. It delivers oxygen, removes carbon dioxide, and carries life-sustaining nutrients. By transporting long-distance messengers such as hormones, blood helps the various parts of the body communicate with each other. These important functions are performed by blood cells working in partnership with the liquid part of the blood (*plasma*). Most of the cells in it are red

blood cells (*erythrocytes*). White blood cells (*leukocytes*) are also present in smaller numbers. Their role is to defend your body against foreign material, including infections, viruses, and fungi.

Anemia is a state that occurs when *hemoglobin* (an iron-protein compound in red blood cells that transports oxygen) is decreased and your body has too few red blood cells.

When there are too few red blood cells due to a lack of vitamin B12, the condition is described as *pernicious anemia*. The term *pernicious* was adopted many years ago when there was no effective treatment and this condition was inevitably fatal. Today, excellent therapies are available and most people can lead a normal life with very little adverse effects.

Pernicious anemia can affect all racial groups, but the incidence is higher among fair-haired people, especially those whose ancestors came from Scandinavia or Northern Europe. It usually doesn't appear before the age of 30, although a juvenile form of the disease can occur in children. About 4% of Canadians have insufficient blood levels of vitamin B12.

Alternative names for pernicious anemia are vitamin B12 deficiency (malabsorption), Addison's anemia, and congenital pernicious anemia.

Causes

Pernicious anemia is caused by a deficiency of vitamin B12, which is needed for normal production of red blood cells. It is often hereditary. Risk factors include a history of *autoimmune endocrine disorders*, a family history of pernicious anemia, and Scandinavian or Northern European descent.

The meat and dairy products we eat are our primary sources of vitamin B12. However, except in strict vegetarians, pernicious anemia isn't simply caused by not eating enough of these foods. Usually, it is because of a failure in the complex process the digestive tract must go through to absorb vitamin B12.

In order for vitamin B12 to be absorbed by the small intestine, the cells that line a part of the stomach must produce a substance called *intrinsic factor* (IF). This substance attaches itself to vitamin B12, and both are absorbed in combination into the lowest portion of the small bowel (*ileum*), just before the small bowel enters the colon. If the ileum is damaged or removed in the course of surgery, the intrinsic factor/vitamin B12 combination will not be absorbed. People with conditions like Crohn's disease, who often have surgery to remove part of their ileum (the part of the small intestine where vitamin B12 is absorbed), should be screened for vitamin B12 deficiency and treated if needed.

Lack of intrinsic factor may also be *congenital* (present at birth). This form of pernicious anemia (called *juvenile* or *congenital*) is usually seen before a child is three years old. It is believed that only one parent needs to carry the gene for this disorder to pass it along to a child.

Less common causes of decreased B12 absorption include *chronic pancreatitis*, malabsorption syndromes, certain medications, and, very rarely, increased metabolism of B12 through longstanding *hyperthyroidism*. A very common cause of B12 deficiency in the elderly is inadequate absorption of dietary B12.

Pernicious anemia is often also seen in combination with some autoimmune *endocrine* (gland) diseases such as type 1 diabetes, *hypoparathyroidism*, Addison's disease, and testicular dysfunction.

Symptoms and Complications

In most cases, there are no early signs of pernicious anemia. As the disorder progresses, there may be shortness of breath and less endurance during exercise. A noticeable rapid heartbeat may also be evident. People with pernicious anemia often have very low hemoglobin but few symptoms of low hemoglobin, such as fatigue. They may also develop low levels of white blood cells (important in fighting infections) and platelets (needed to help clot blood and stop bleeding). However, infections and bleeding complications rarely occur in people with pernicious anemia. Other symptoms that may develop include:

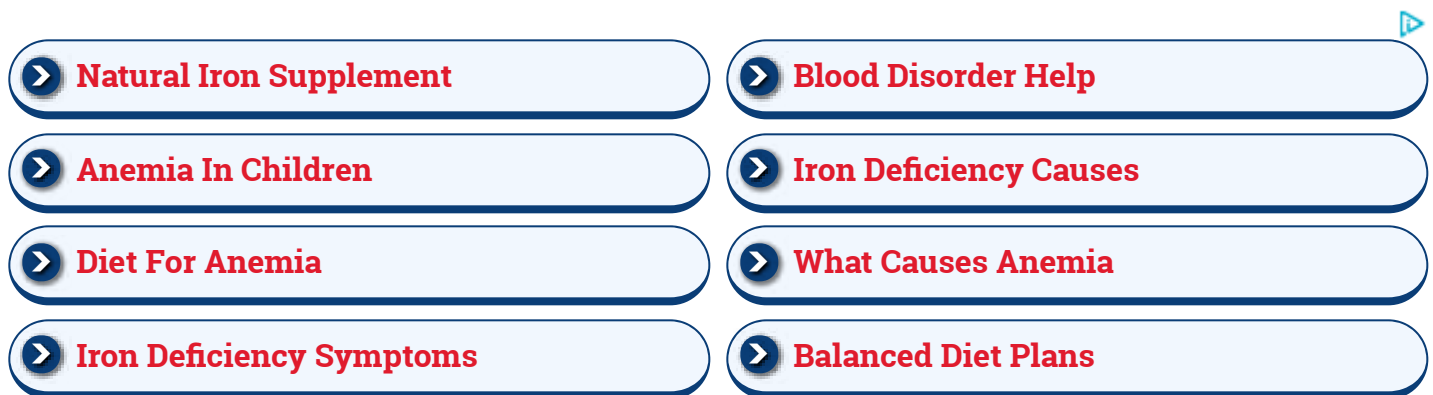
- pale skin
- a sore, shiny tongue
- poor appetite and loss of weight
- tingling and numbness of hands and feet
- disturbed walking gait and balance (especially in the dark)
- mental changes, including memory loss, irritability, mild depression, and dementia
- yellow-blue colour blindness

If left untreated, the lack of vitamin B12 may gradually affect the sensory and motor nerves and cause neurological effects. The anemia can also affect the gastrointestinal system and cardiovascular systems, result in tongue problems, impair the sense of smell, and

cause bleeding gums and the loss of deep tendon reflexes. In very advanced cases, paranoia, delirium, and confusion may also occur.

Pernicious anemia is a chronic disease that progresses slowly and steadily. In the past, before much was known about the disease and there was no treatment, it would eventually cause death after many years of suffering. Today, the prognosis is excellent. Replacement therapy with adequate amounts of vitamin B12 will correct the deficiency and allow a person to lead a normal life.

If the condition progresses for a long time before it's detected, it may damage certain parts of the body, primarily the nervous and digestive systems. Gastric polyps may develop, which leads to a greater chance of developing gastric cancer. Vitamin B12 deficiency will affect the appearance of epithelial cells on the cervix, and an untreated woman may get a false positive result on a Pap test.



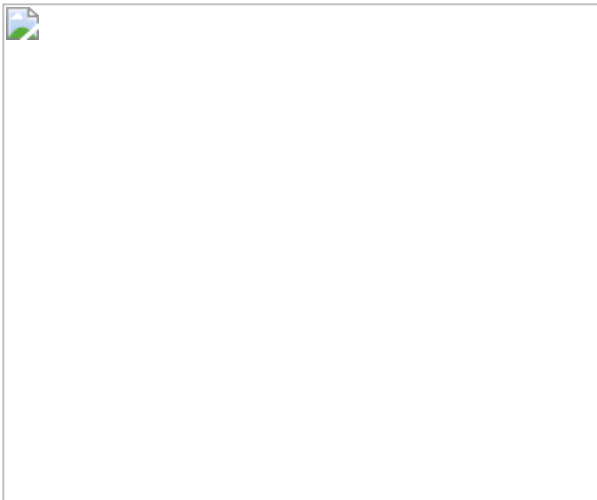
Making the Diagnosis

If you have the basic symptoms of anemia, your doctor will probably perform various tests. One of these tests will measure the amount of vitamin B12 in the blood. The blood will be examined under a microscope to assess the size and shape of the red blood cells. In cases of pernicious anemia, these cells will be larger and there will be fewer of them.

If the amount of vitamin B12 in the blood is found to be low, your doctor may perform additional tests to confirm that your body has sufficient levels to perform regular cell processes. Rarely, a bone marrow test is needed to confirm the diagnosis.

Historically, a test called the *Schilling test* was ordered, but this is no longer performed in common practice.

People with pernicious anemia have an increased incidence of stomach cancer. The doctor will need to follow up on any clinical findings (e.g., symptoms, positive test for traces of blood in the stool) that suggest a problem with the digestive system, and further tests such as X-rays or an *endoscopy* (inspecting the inside of the body with a small viewer on a flexible tube) may be necessary.



Treatment and Prevention

The amount of B12 stored in the body is directly related to the amount that is taken in.

The main treatment for pernicious anemia is injections of vitamin B12. Calculating the required amount of vitamin B12 needed can be difficult, because it must also replace the B12 stored in

the liver.

At first there may be 5 to 7 injections in a short span of time. This therapy usually makes a difference within 48 to 72 hours, so there shouldn't be any need for a blood transfusion. Eventually, injections can be given once a month and will probably continue indefinitely. Recently it has been found that vitamin B12 can be given by mouth in very large doses (0.5 mg to 2 mg per day) for maintenance treatment, making injections unnecessary.

Pernicious anemia cannot be treated without the help of a doctor. However, a well-balanced diet is essential to provide other components necessary for healthy blood cell development, such as folic acid, iron, and vitamin C.

Vitamin B12 therapy must be maintained for life unless the underlying cause of the deficiency is corrected.

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Balanced Diet Plans	Diet For Anemia
Natural Iron Supplement	Anemia In Children
Blood Disorder Help	Iron Deficiency Causes
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What Causes Anemia	Coconut Oil Hair Loss