What is vitamin B12 deficiency anemia?
Anemia is a condition in which the body does not have enough healthy red blood cells. Red blood cells provide oxygen to body tissues. There are many types of anemia.

Vitamin B12 deficiency anemia is a low red blood cell count due to a lack of vitamin B12. Your body needs vitamin B12 to make red blood cells. In order to provide vitamin B12 to your cells the following must occur:
- You must eat plenty of foods that contain vitamin B12, such as meat, poultry, shellfish, eggs, and dairy products.
- Your body must absorb enough vitamin B12. A special protein, called intrinsic factor, helps your body do this. This protein is released by cells in the stomach.

What causes vitamin B12 deficiency anemia:
- A lack of vitamin B12 may be due to dietary factors, including:
  - Eating a vegetarian diet
  - Poor diet in infants
  - Poor nutrition during pregnancy
- Certain health conditions can make it difficult for your body to absorb enough vitamin B12. They include:
  - Gastric surgeries that remove certain parts of your stomach or small intestine
  - Crohn disease, celiac disease, infection with the fish tapeworm, or other problems that make it difficult for your body to digest foods
  - Pernicious anemia, a type of vitamin B12 anemia that occurs when your body destroys cells that make intrinsic factor
  - Taking antacids and other heartburn medicines for a long period of time
  - Chronic alcoholism

What are the symptoms?
You may not have symptoms. Symptoms may be mild.

Symptoms can include:
- Diarrhea or constipation
- Fatigue, lack of energy, or light-headedness when standing up or with exertion
- Loss of appetite
- Pale skin
- Problems concentrating
- Shortness of breath, mostly during exercise
- Swollen, red tongue or bleeding gums

If you have low vitamin B12 level for a long time, you can have nerve damage. Symptoms of nerve damage include:
- Confusion or change in mental status (dementia) in severe cases
- Depression
- Loss of balance
- Numbness and tingling of hands and feet

What exams and tests will be performed?
The doctor or nurse will perform a physical exam. This may reveal problems with your reflexes.

Tests that may be done include:
- Complete blood count (CBC)
- Reticulocyte count
- LDH level
- Vitamin B12 level

Other procedures that may be done include:
- Esophagastroduodenoscopy (EGD) to examine the stomach
- Enteroscopy to examine the small intestine
- Bone marrow biopsy if the diagnosis is not clear
How does gastric bypass surgery cause vitamin B12 deficiency?

The surgery makes changes to the stomach and small intestine that causes a change in the way your body handles the food you eat. You will eat less food, and your body will not absorb all the calories and nutrients from the food you eat.

- Roux-en-Y (gastric bypass surgery) removes a portion of the stomach and bypasses part of the small intestine, which is where intrinsic factor is produced and most absorption of vitamin B12 occurs.
- For this reason, vitamin B12 supplementation must be taken for the rest of your life by either an injection or by mouth through a sublingual pill.

After gastric bypass surgery, your body will not absorb some important vitamins and minerals. You will need to take these other vitamins and minerals for the rest of your life:

- Multivitamin with iron
- Calcium (1,200 mg per day) and vitamin D. Your body can absorb only about 500 mg of calcium at a time. Divide your calcium into 2 or 3 doses during the day. Calcium must be taken in the "citrate" form.

You may need to take other supplements also.

You will need to have regular checkups with your doctor to keep track of your weight and to make sure you are eating well. These visits are a good time to talk with your doctor about any problems you are having with your diet.

Follow Your Diet Carefully

You will need to make sure you are getting enough protein, vitamins, and minerals while you are losing weight quickly. Eating mostly protein, fruits, vegetables, and whole grains will help your body get the nutrients it needs.

Calories Still Count

- Avoid foods that are high in calories. It is important to get all of the nutrition you need without eating too many calories.
- Do NOT eat foods that have a lot of fats, sugar, or carbohydrates.
- Do NOT drink much alcohol. Alcohol has a lot of calories, but it does not provide nutrition.
- Do NOT drink fluids that have a lot of calories. Avoid drinks that have sugar, fructose, or corn syrup in them.
- Avoid carbonated drinks (drinks with bubbles), or let them go flat before drinking.
- Portions and serving sizes still count. Your dietitian or nutritionist can give you suggested serving sizes of the foods in your diet.

What is the treatment for vitamin B12 anemia?

- Treatment depends on the cause of B12 deficiency anemia. The goal of treatment is to increase your vitamin B12 level.
- Treatment may include a shot of vitamin B12 once a month. Persons with a severely low level of B12 may need more shots in the beginning. You may need shots every month for the rest of your life.
- Some patients may also need to take vitamin B12 supplements by mouth. For some people, high-dose vitamin B12 tablets taken by mouth work well, and shots are not needed.

Your doctor or nurse will also recommend eating a well-balanced diet.

How can I prevent vitamin B12 anemia?

- You can prevent anemia caused by a lack of vitamin B12 by following a well-balanced diet.
- Shots of vitamin B12 can prevent anemia after surgeries known to cause vitamin B12 deficiency.
- Early diagnosis and prompt treatment can reduce or prevent complications related to a low vitamin B12 level.

Outlook (Prognosis)

Patients often do well with treatment.

Long-term vitamin B12 deficiency can cause nerve damage. This may be permanent if you do not start treatment within 6 months of when your symptoms begin.