2 Pernicious anaemia

There are a number of causes of low vitamin B12 levels (see Table 1 below), but pernicious anaemia is among the most important to identify. Pernicious anaemia is rare in people under 30 years.

The diagnosis of pernicious anaemia identifies the need for lifelong vitamin B12 treatment and is associated with other autoimmune endocrinopathies, particularly thyroid disease and diabetes. There is also a small, increased incidence of stomach cancer.

Parietal cell and intrinsic factor antibody tests should be requested for a patient with low vitamin B12, and signs/symptoms consistent with pernicious anaemia. Ninety percent of people with pernicious anaemia will test positive for one or both of these tests.[1]

Initial testing once low vitamin B12 levels detected	
Intrinsic factor antibody	✓
Parietal cell antibody	✓
Schilling test	✗

Lab tests:[1,3,4]

- Intrinsic factor antibodies:
  - Very specific and virtually diagnostic for pernicious anaemia but sensitivity is low (approximately 60%)
  - Absence does not rule out a diagnosis of pernicious anaemia
- Parietal cell antibodies:
  - High sensitivity (85–90%) meaning most patients with pernicious anaemia will have positive parietal cell antibodies, but low specificity, yielding higher number of false positives
  - Incidence of these antibodies in healthy individuals increases from 2.5% of those in their twenties, to 10% of those in their seventies. The test may be positive in 20–30% of first degree relatives of patients with pernicious anaemia as well as in patients with other autoimmune endocrine disorders.
- Schilling test:
  - Rarely used and difficult to perform (involves radio-labelled vitamin B12)
  - Has been superseded by antibody testing

Table 1: Possible causes of low vitamin B12:[2]

- Nutritional deficiency – the main dietary sources are meat and dairy products therefore elderly patients with "tea and toast" diets, chronic alcoholics and strict vegans are especially at risk
- Gastric causes e.g. pernicious anaemia, gastrectomy
- Intestinal causes e.g. ileal disease/resection
- Severe pancreatic insufficiency
- Drugs e.g. oral contraceptives, metformin, long term proton pump inhibitor therapy

Interpreting results

	Intrinsic factor antibody (IFA) Negative	Intrinsic factor antibody (IFA) Postive
Parietal cell antibody (PCA) Negative	Pernicious anaemia unlikely	Immunological evidence of pernicious anaemia
Parietal cell antibody (PCA) Positive	• Not diagnostic • PCA positive in 85–90% of patients with pernicious anaemia • Negative IFA does not exclude pernicious anaemia (only present in 50% or less)	Immunological evidence of pernicious anaemia

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2. Snow CF. Laboratory Diagnosis of Vitamin B12 and Folate Deficiency. A Guide for the Primary Care Physician. Arch Intern Med. 1999;159:1289-1298.

3. Lahner E, Annibale B. Pernicious anemia: New insights from a gastroenterological point of view. World J Gastroenterol 2009;15(41): 5121-5128.

4. The Pernicious Anaemia Society. Intrinsic factor and parietal cell antibodies.

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