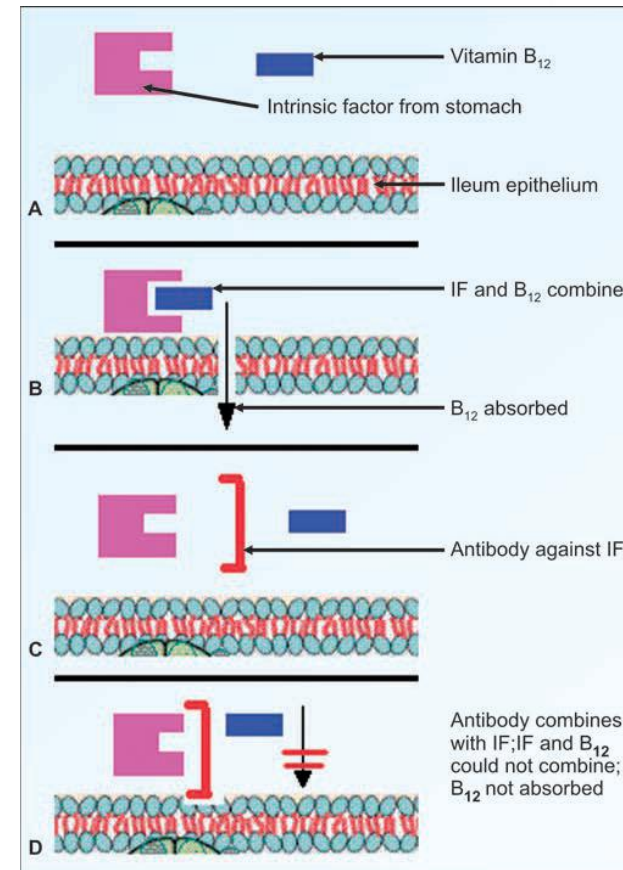
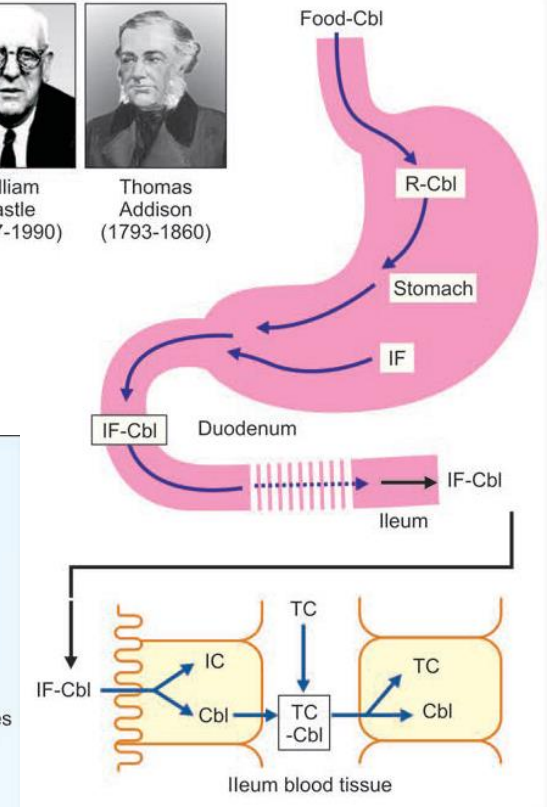


# Vitamin B12

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# Vitamin B12 (cobalamin)- intro

- Vitamin B12 is water soluble, heat stable
- Only present in animal sources (vegans need to take)
- 4 forms: Cyano (oral), hydroxy (injectable), adenosyl (storage) and methyl (blood) **cobalamin**
- Absorption requires 2 factors
- Generally, B complex vitamins are not stored in the body, B12 is an exception
- Whole liver contains about 2 mg of B12, which is sufficient for the requirement for 2-3 years. So, B12 deficiency is seen only years after gastrectomy



# Causes of deficiency

- Developing countries: strict vegans, low socioeconomic status
- Most common cause in developed countries is impaired absorption due to a loss of gastric intrinsic factor (IF) which must be bound to a food-source of B12 in order for absorption to occur
- A second major cause is an age-related decline in stomach acid production (achlorhydria) → ppl on long term PPI

## MIND

- Weakness and fatigue
- Mood swings
- Blurred vision
- Dizziness
- Inflamed tongue or mouth ulcers
- Forgetfulness
- Anxious feelings

## BODY

- Pale or jaundiced skin
- High temperature
- Lack of coordination
- Unusual sensations

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# 11 SYMPTOMS OF VITAMIN B12 DEFICIENCY AND HOW IT AFFECTS YOUR BODY



## 6 medicines that can lead to vitamin B12 deficiency

**H2 blockers**  
taken for heartburn



**Metformin**  
taken for diabetes type 2



**Colchicine**  
taken for gout



**Methyldopa**  
taken for hypertension



**Neomycin**  
used for dermatitis



**Aminosalicilic acid**  
taken for Crohn's disease



Source: Gröber, U: Mikronährstoffe, 2. edition, 2006, WVG Stuttgart

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# Manifestations of vit B12 deficiency

- **Demyelination:** Due to the non-availability of active methionine → methylation of phosphatidyl ethanolamine to phosphatidyl choline is not adequate  
→ This leads to deficient formation of myelin sheaths of nerves, demyelination and neurological lesions
- **Subacute combined degeneration:** There is demyelination affecting cerebral cortex as well as dorsal column and pyramidal tract of spinal cord  
→ Symmetrical paresthesia of extremities, alterations of tendon and deep senses and reflexes, loss of position sense, unsteadiness in gait, positive Romberg's sign (falling when eyes are closed) and positive Babinski's sign (extensor plantar reflex) are seen.

# Replacement

- Severe vitamin B12 deficiency is initially corrected with daily intramuscular injections of 1000  $\mu\text{g}$  of the vitamin
  - followed by maintenance via monthly injections of the same amount or daily oral dosing of 1000  $\mu\text{g}$
- The daily dose is far in excess of the vitamin requirement because the normal transporter protein mediated absorption is absent, leaving only very inefficient intestinal passive absorption

