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## Vitamin B12 With Tracey Witty

### About Tracey Witty

- Inherited B12 deficiency and cannot absorb B12 from food – requires injections for life.
- Committed time and effort in raising awareness and giving people access to the right information about B12 deficiency – fills the gap in the education of many health professionals and gives everyone a better chance of understanding B12 deficiency and taking action.
- As a researcher and administrator, she personally runs and updates the [www.b12deficiency.info](http://www.b12deficiency.info) website daily and answers emails.
- Voted as one of the Arriva Bus Leicester Stars in August 2016. Her name appeared on an Arriva Eco bus which led to more B12 deficiency awareness locally.

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### Vitamin B12

- Different from many vitamins. Complex and must be supplemented in injection form if people have gastric problems. In these cases, Vitamin B12 in tablet form cannot suffice.
- It has no known toxicity in over 50 years. But there is a rare chance of an anaphylactic reaction to cobalt in B12 itself or the buffers in the injection solution.

## **Serum B12 blood test**

- Known to be inaccurate. Tests both active and inactive B12 – up to 80% could be inactive (i.e. B12 analogues which the body cannot use and does not recognise).
- Patients should avoid B12 supplementation before testing for deficiency, in order to get a clear baseline result.
- It has no standard reference range (i.e. can be from 110 in Lancashire to 220 in Charnwood). There are people who can be “within range” but highly symptomatic and are not given appropriate treatment.
- The lower end of the reference range in many NHS areas is set too low, meaning that people who are actually deficient might not be given a correct diagnosis.
- In general, if test results are within the “normal” range, a patient’s symptoms may be misdiagnosed – chronic fatigue, fibromyalgia, bipolar, etc.
- The patients who are tested while already on B12 supplementation may be within range or much higher but their nerves are not healing – the deterioration continues within.
- The active B12 test (eg Holotranscobalamin assay ) is not a “gold standard either”. Reliance on just the serum B12 test would not be helpful for a patient who is symptomatic.
- Other tests alongside the serum B12 blood test are MMA (Methylmalonic Acid) and homocysteine (an amino acid that rises to toxic levels with low B12). The homocysteine reference range upper level is about 15, an optimal level is about 6.
- A full blood count can give clues on a mean corpuscular volume on a mean cell haemoglobin provided an individual knows what to look for. The symptoms of each patient might be really extreme, which is why it is not advisable to rely solely on a blood test.
- GPs generally conduct blood tests in their own particular laboratories. Osteopaths and chiropractors have to find a private laboratory to do the tests for them.

## **MMA test**

- This type of test measures the amount of Methylmalonic acid (MMA) in the patients’ urine. The body produces large amounts of MMA when vitamin B-12 decreases. The American B12 website ([www.b12.com](http://www.b12.com)) claims that a urine MMA test is more accurate.
- This is recommended for needle-phobic individuals and children.

## Signs and symptoms of B12 deficiency

Memory loss	Bladder and bowel problems
Blurry vision	Premature greying of hair
Tinnitus, numbness and tingling in the feet	Infertility
Anxiety and depression	Psychosis
Abnormal gait, problems with balance and physical strength	Nominal aphasia (inability to recall names and words)
Numbness or impaired pain perception	
Radiculopathy	Chronic fatigue
“Brain fog”	General tiredness

- B12 deficiency does share symptoms with Coeliac disease (i.e. absorption problem), thyroid problems, and Pyroluria (i.e. Zinc and B6 deficiency).
- The symptoms of multiple sclerosis are similar to B12 deficiency.
- Around 5-20% of the general population is afflicted with B12 deficiency.
- “Pernicious anaemia” describes B12 deficiency due to lack of intrinsic factor. Intrinsic factor is necessary for the body to absorb B12 from food; without it (and therefore without B12) the body cannot make enough red blood cells. Some GPs assume that there has to be a coexisting anaemia for a patient to be B12-deficient. However, the neurological changes can precede the haematological changes.
- With B12 deficiency, the nerves lose their myelin sheath, potentially affecting both central and peripheral nervous systems.
- B12 deficiency should always be ruled out in patients with relevant symptoms (eg neurological symptoms / psychotic behaviour). Vegans are at particular risk, because there is no B12 in a vegan diet.

### People who are prone to B12 deficiency

- Those on Metformin/Glucophage (which interferes with B12 absorption); those with Methylation issues (which affects 40% of the population); those who have undergone gastric surgery; those with Crohn’s disease, among others.
- With age, people have less stomach acid which leads to an inability to unbind B12 from food.

- People with thyroid conditions (i.e. hyperthyroidism, hypothyroidism, Grave's disease) could also be B12 deficient. They can have very low stomach acid levels.
- There can be genetic reasons or inborn errors of B12 metabolism in B12 deficient children – may be acquired by babies who were breastfed by B12 deficient mothers. Drugs with a large amount of acid suppressants given to babies in the US may be one of the triggers for B12 deficiency.
- Anyone who is avoiding certain foods (i.e. animal products) in their diet is going to be more susceptible to B12 deficiency than somebody who is eating eggs, meat, fish and dairy.
- Patients with peripheral neuropathy and anxiety should be checked if there is an underlying B12 deficiency rather than simply being treated with antidepressants.

### **Drugs that interfere with B12**

- PPIs (proton pump inhibitors). PPIs include drugs ending in “-zole” (eg omeprazole). Note that patients prescribed aspirin or naproxen may also be prescribed a PPI to offset the likelihood of gastric problems.
- Metformin
- Antacids.
- Drugs for gout.
- Some antibiotics.
- Nitrous Oxide (laughing gas”) can inactivate B12. N<sub>2</sub>O is used for pain relief in labour, and is associated with postnatal depression. The latter can be a result of an undiagnosed mother having their B12 inactivated. If they breastfeed, the baby is not accessing B12 either. The recreational use of N<sub>2</sub>O has increased over recent years.

### **B12 supplements**

- If a person can absorb B12 through their stomach then B12 supplements can help them. The key question is – do they feel well with supplements?

- Vegans who are seriously low in B12 should be given B12 injections for a swift recovery. It is important to note that vegans may also have pernicious anaemia or methylation problems or other problems related to the stomach.
- Hydroxocobalamin is an injectable form of B12 that is used on the NHS. Injections are licensed for intramuscular use but people who manage their own injections commonly use the subcutaneous route.
- Methylcobalamin and Cyanocobalamin are dietary B12 supplements. The NHS normally prescribes the latter in tablet form – usually doses of 50 µg, which is too little.
  - Methylcobalamin is an active form of B12. Methylcobalamin can be obtained through supplements and food sources such as meat, eggs, dairy and fish.
  - Cyanocobalamin contains a cyanide molecule and is a synthetic form of B12 – when it enters the body it is converted into both methylcobalamin and adenosylcobalamin (both are active forms of B12 in humans).
- Sub-lingual B12 is taken by some people in between injections but does not suit everyone.
- Rich sources of B12 are meat, fish, eggs, dairy, and shellfish. B12 deficiency can sometimes be linked to lack of nutrients in the soil (i.e. cobalamin or cobalt comes from the soil and there are many cobalt-deficient areas in the UK such that the animals farmed and fed on those areas have to be given B12 supplements).
- People need to assess the form of B12 which best suits their genes. Cyanocobalamin is said to be an inferior form of B12 but many Americans and Canadians use it successfully.
- Folate is the “big sister” to B12. Patients will not be able to get the maximum benefit from their injection if they lack folate. They also need to make sure their potassium and iron levels are within range too.
- It is recommended for people to take B-complex and folate (B9) alongside their B12 injection. The best time to take supplements depends on the individual.
- Oral B12 supplementation is useless in patients who are taking PPIs. They need B12 injections instead.
- High doses of B12 can be an antidote for cyanide poisoning, CO poisoning and other toxins.
- Spirulina and seaweed contain B12 analogues – not recognised by the body and are not useful sources of B12.

### **Treatment process**

- If patients are B12-deficient and they have stomach problems which cause an inability to absorb B12 from food, the appropriate treatment is B12 injections. NICE recommendation for those neurologically affected is injections every other day for as long as it takes. An ampoule is 1 ml.
- When the symptoms start improving, patients should move to maintenance dosage of every two months.
- Unfortunately, normal practice is that patients are given two weeks of loading doses (i.e. every other day injections – Monday, Wednesday, Friday), then placed into a three-monthly regime.
- While B12 can be self-injected, most patients are not trusted to give themselves their own injection. But since it is difficult for some patients to get appointments especially when they are on every-other-day injections, it is helpful if nurses teach self-injection.
- The injections can administered either into arm, thigh, hip or buttocks. They are a necessity for patients who are chronically ill, have plenty of B12 deficiency symptoms, and whose condition is deteriorating.
- The upper reference range of continually-tested patients is irrelevant once they are in treatment hence there is no need to continually monitor the serum B12 levels.
- Where neuropathy, cognitive impairment or neurological symptoms persist, patients should be on every other day injections until their symptoms reduce or disappear.
- People should report to their GP if they feel an improvement after a series of B12 loading doses. They should continue to monitor how they are feeling as they continue with their doses.

### **Treatment duration**

- If people cannot absorb B12 from food, the supplementation should carry on for life.
- All symptoms of B12 deficiency, when caught early enough and treated aggressively enough can be reversed.
- B12-deficient children, when not treated early enough and while their systems are still developing, can end up with developmental delay and other problems.

## Other negative effects of B12 deficiency

- Destroys relationships with family members and friends because of how much it affects people's mental health.
- Makes people very isolated. Interferes with schooling.
- Affects foetuses, babies and small children.

## Other relevant notes

- If the serum B12 test result is within range, patients may visit the following website <https://www.b12deficiency.info/> then click "**What to do next**" for further guidance.  
**Note:** Patients should remain under the care of their GP wherever possible.
- Patients need to be listened to as individuals and treated as per their particular symptoms. Many people can cope well on a three-monthly B12 shot, particularly if they have not been deficient for long.
- Tracey Witty has initiated a petition to ask for B12 ampoules to be made available over-the-counter. More signatures are needed in order to raise B12-deficiency awareness ([bit.ly/b12-petition](http://bit.ly/b12-petition))
- Nerve damage due to B12 deficiency can be reversed depending on how long the patients had been untreated for, the extent of their deterioration, and how effectively they get treated.
- Make your point clear when with a GP regarding B12-deficiency symptoms. Use evidence (i.e. research papers).