

**Leigh Ann Chapman, ND**  
*Integrative Family Medicine*  
**www.ChapmanND.com**

## **Methyl B-12 General Information**

### **What is Methyl B-12?**

B<sub>12</sub> (cobalamin) is a vitamin “family” with five unique family members that each do different things: a) cyanocobalamin; b) hydroxycobalamin; c) adenosylcobalamin; d) glutathionylcobalamin; e) methylcobalamin. Out of the B<sub>12</sub> family, only methyl-B<sub>12</sub> has the ability to activate the methionine/homocysteine biochemical pathway directly. It is this pathway that is responsible for the body’s sulfur-based detoxification system and the formation of S-adenosylmethionine (SAMe), the body’s universal methyl donor. This pathway is also directly involved in the synthesis of glutathione, the body’s primary intracellular antioxidant. Glutathione is responsible for detoxification reactions, most notably those that involve the binding and removal of heavy metals, as well as immune system activation.

Methyl-B<sub>12</sub> is also closely allied with the folic acid biochemical pathway. A precursor folic acid molecule must interact with the enzyme MTHFR (methylenetetrahydrofolic acid) to become 5-methyltetrahydrofolic acid, the molecule that donates its methyl group to B<sub>12</sub> so it can become methyl-B<sub>12</sub>. Unfortunately, many children with autism have a genetic defect in this enzyme making the activation of folic acid and B12 less effective.

### **Effects of Methyl B-12**

Many children respond to methyl-B<sub>12</sub> therapy. Executive function may improve in things like awareness, cognition, appropriateness, eye contact when called, and “just being more like a normal kid”. Speech and language may improve— all phases including spontaneous language, more complex sentences, increased vocabulary, etc. Socialization and emotion may improve – initiation and interactive play, understanding and feeling emotions, possibly for the first time or to a much more normal degree. It is important for parents and clinicians to understand that the positive effects of methyl-B<sub>12</sub> are predictable, reproducible, consistent, and undeniably obvious within the first five weeks of therapy.

### **Side Effects**

Side effects are not uncommon and of two types: tolerable and intolerable. Our goal is to obtain the maximum clinical benefits while instigating the least amount of side effects. Side effects should diminish or disappear within 1 to 4 months. The most common side effects are increased activity levels with or without stimming, sleep disturbances, and increased mouthing of objects. Some children, due to their increased awareness, will have a transition time in which they may act out or tantrum. While this is undesirable, it is not always a true negative effect and we must remedy it appropriately.

Methyl-B<sub>12</sub> is a treatment, not a cure. However, many children using methyl-B<sub>12</sub> combined with other biomedical and non-biomedical therapies have improved tremendously. It is important that all parents and clinicians understand that the maximum

results from methyl-B<sub>12</sub> therapy occur over years, not months, not weeks. Though the initial results will be obvious within the first five-week period of time, methyl-B<sub>12</sub>'s power is in long-term use.

### **How do I know if my child will respond?**

Currently there is no test that can accurately predict clinically which children will and which children will not respond to methyl-B<sub>12</sub> shots. Research is underway at this time to evaluate genomics and single nucleotide polymorphisms (“SNPs”) as ways to predict which children will respond to methyl-B<sub>12</sub>. However, though theoretically promising, at this time only the child's own body – his or her true laboratory -- is able to produce conclusive results whether the child is a methyl-B<sub>12</sub> responder or not.

### **Injection Steps:**

Do the following in *quick succession*. You may want to *practice* the moves first using an orange

- a. Clean the area thoroughly with alcohol
- b. Note the “*target area*”. With your thumb and middle finger holding the syringe (similar to holding a dart) and your index finger on the plunger of the syringe, *quickly* insert the needle **AT A 10-30 DEGREE ANGLE** (this way it is impossible to go “too deep”) until it stops at the hub of the needle/syringe. This shallow angle allows for the injection to go **into the subcutaneous fat** creating a reservoir or medicine that is time released. *Immediately* inject all of the solution within 1-2 seconds.
- c. *Quickly* withdraw the needle and *immediately* put it into the “**sharps container**”. (See “Sharps Container” below)
- d. If you do everything gently, your child will usually not be bothered..

### **When is the best time to administer and injection?**

You may do the injections while the child is sleeping or during the day. You must find a system that works for you. They are quick, essentially painless, rarely felt by the child at all, and many children never wake up if done at night.

If your child is a light sleeper and awakens whenever you attempt to give the shot at night, switch and give the shots during the day.

### **Is there any pain?**

Your child should feel no pain at all for the majority of the shots you administer. If you think your child is experiencing pain and not just irritation at having to do something that he or she would rather not, consider the following.

1. Shots should not hurt if the pH is correct. The compounding pharmacist we work with gives herself a shot out of every batch to make sure it does not hurt. The pH is always tested.
2. Even in perfectly administered shots, at times there may be a set of nerve fibrils that are closer together or more sensitive than others. One cannot know ahead of time where these anatomical variations are located. If a child “accidentally” receives a shot in such a location, some discomfort or mild pain may be felt. As a

- general rule, if the injection site is moved an inch or two, the next shot should be fine.
3. The larger the volume of a shot, the more pressure effect/tissue stretching effect that may occur and in a sensitive child cause a feeling of discomfort. It also important to remember that the sensation of “fullness” may cause a child to “touch the spot” where you administered the shot but this does not necessarily mean that this is a “painful sensation”.
  4. If you really think something may be wrong, give yourself a shot and see if it is painful.

### **Sharps Container?**

It is important to make sure that needles are discarded properly. You may purchase a sharps container at any pharmacy and the price will include disposal. The following description will allow you to make a homemade version of a sharps container.

1. Obtain a large coffee can that has a plastic lid.
2. Make two slits at a 90-degree angle to each other in the center of the plastic lid.
3. Securely tape the lid to the can.
4. Check to make sure that you can push a syringe through the slits but that the slits are not wide enough for “little fingers” get through.
5. When the coffee can is full, securely tape it shut by covering the slits.
6. Once secured, the can may be disposed with normal trash. It is perfectly legal for “personal” medical waste to be disposed in this manner