The Amazing Benefits of Methyl-B12 Therapy For Autism Recovery

Including Pervasive Development Disorder (PDD), Attention Deficit Disorder (ADD), & Other Spectrum Disorders)

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For the past decade and half many parents with children on the autism-spectrum (ASD) have been seeing the incredible benefits of a therapy called Methyl-B12. What they have reported as far as positive changes is consistent with what is known to be major areas of problems seen in autism – attention/focusing, language disorders, odd behaviors, and lack of interest in peers. In short, Methyl-B12 has the unique ability in many children, teenagers, and adults on the autism-spectrum to improve their overall cognitive abilities helping them reach new goals and levels of achievement in their growth and development.

This book is a valuable resource for anyone (parent or health care practitioner) wanting to know more about the benefits of Methyl-B12 therapy for autism related disorders, as well as how to obtain it, how to administer it, what improvements can be seen with its use, safety concerns and side effects, and much more. The preferred route of administration discussed in this book is via subcutaneous (underneath the skin) injection. However, additional information is given regarding nasal Methyl-B12, as well as oral administration. In my experience, Methyl-B12 has been one of the single most effective biomedical therapies for autism, and it is a remedy that ideally should be tried for anyone with a spectrum disorder such as autism, pervasive development disorder, sensory and language disorders – even individuals with attention deficit or other neurological disorders can benefit.
What is Methyl - B12?

Much appreciation needs to go out to the brilliant work of Jim Neubrander, M.D. (www.drneurbanner.com), the founder of Methyl-B12 therapy, for his great contribution to the field of biomedical intervention. This book is dedicated in his honor – Kurt N. Woeller, D.O.

Methyl-B12 (MB-12) stands for methylcobalamin – a particular form of vitamin B12. Like its counterparts – hydroxycobalamin, adenosylcobalamin, cyanocobalamin – methylcobalamin has specific biomedical influences in the human body. MB-12 influences the positive changes seen with individuals on the autism-spectrum regarding attention (1), awareness, mental and emotional stability, language improvements, and social interaction. MB-12 is at the middle of the biochemical underpinnings in autism and it accentuates a very important system in our body called ‘Methylation.’

Methylation is a vital biochemical reaction that supports the cardiovascular, hormone, immune, and detoxification systems, DNA/RNA structure and function, and other key metabolic systems. There are some effective therapies that support this biochemical process namely MB-12, as well as other methylating supplements such as dimethylglycine (DMG) and trimethylglycine (TMG). However, according to James Neubrander, M.D., the pioneer of MB-12 therapy, the subcutaneous injection route of MB-12 is the most consistent (with respects to dosing) and effective. From my years of experience in treating individuals on the autism-spectrum I agree 100% with Dr. Neubrander’s assessment about the injectable (subcutaneous) route - it is the most effective form.
NOTE: The previous paragraph is not to insinuate that other forms of Methyl-B12 are not helpful, such as nasal spray or oral sublingual routes. I understand that doing a subcutaneous injection is not possible or practical for everyone so I will also be discussing alternative routes of Methyl-B12 administration as well in this book.

Re-Methylation (or Methylation)

This pathway involves the conversion of homocysteine to methionine. Production of methionine, an amino acid, is the rate-limiting step for the conversion of other necessary proteins that affect the heart and blood vessels, muscle tissue, immune and nervous systems. The conversion of homocysteine to methionine can occur by direct transference of a methyl (CH3) group from methylcobalamin (B12) or betaine (trimethylglycine or TMG). Homocysteine sits at a junction of two different biochemical reactions. Because of its position in this biochemical matrix it has the capacity to impact methylation and sulfur group transference processes in the body. The most recognized impact of homocysteine is increased risk for cardiovascular disease (2).
However, in children with autism a faulty methylation system affects other functions as well, particularly cognitive function including concentration, attention, and language.

Trans-Sulfuration

This pathway involves degrading homocysteine to two different amino acids - taurine and cysteine. Taurine is most commonly known for its cardiac and liver support, detoxification, bile acid formation and cholesterol excretion. Cysteine has direct influence on glutathione production. Glutathione is a potent anti-oxidant and has protective effects against DNA/RNA damage, as well as being involved in heavy metal and chemical detoxification and immune function. Many individuals on the autism-spectrum have dysfunctions with regards to taurine and cysteine production.

There are many intermediary steps involved in these two important biochemical reactions. What is important is to keep the big picture in mind when referencing these pathways. Envision a wheel that is constantly spinning in a clockwise direction (see diagram above). Homocysteine is at 6 o'clock and Methionine is at 12 o'clock. The goal is to get from 6 o'clock to 12 o'clock and then from 12 o'clock back to 6 o'clock. If any one of these intermediary steps is blocked then the wheel slows down causing biochemical imbalances. This causes a backlog of chemical information that has deleterious effects on other dependent systems, i.e. immune, hormone, detoxification, and DNA/RNA structure and function.
MB-12, Folic Acid

(More specifically methyl-folate), and Betaine (TMG) are responsible for taking homocysteine from 6 o'clock to methionine at 12 o'clock. SAMe (s-adenosylmethionine) the body's "universal methyl donor" helps take methionine from 12 o'clock to homocysteine at 6 o'clock. Along the way other important chemicals are being spun off in different directions to support the many dependent biochemical reactions which are required by the immune, cardiovascular, hormone, and detoxification systems.

The biochemical problem with many ASD individuals is that this system does not operate properly (3). This can have an enormous negative impact on health such as increased chronic infections, inability to detoxify chemicals and heavy metals, and neuro-cognitive problems such as language processing, attention, and concentration. Genetic susceptibility certainly plays a role. However, for many the problem does not manifest until their body is negatively impacted by nutritional deficiencies, digestive problems from yeast, bacteria, parasites, malabsorption from digestive inflammation, chemical pollutants, and heavy metal toxins from vaccines or environmental exposures.
What Can You Expect To See From Methyl - B12 Therapy?

MB-12 has tremendous healing potential for individuals with an autism-spectrum disorder, including:

• **Improved language abilities - both receptive and expressive**

Many parents report their child becomes more conversational – attempting new words, or having more complex speech. Also, a child begins to understand instructions and requests things more easily and readily.

In one memorable case, I had a child go from a 30 word vocabulary to an impressive 200+ words in 3 weeks. Non-verbal children will many times start to babble more, or become more interested in attempting speak.

• **Increased Environmental Awareness**

Many parents report that their child becomes more aware of their surroundings, more engaged with their environment – such as toys, other people, pets, etc.

• **Better Attention And Focusing Abilities**

Teachers and therapists often indicate better attention and focusing in school or therapy sessions. When this happens children become more receptive to learning and are more engaged in the learning process.
• **Improved Social Awareness And Interest**

Parents often report that their child seems more interested in social interaction, particularly with other children. Sometimes this manifests as a child becoming more engaged in sharing or exploring social situations.

• **Increased Mental Processing Skills**

Parents, therapists, teachers will often report a greater capacity for memory recall and retention, academic skills, etc.

• **Supports Normal Detoxification Capacity**

Biochemically, MB-12 assists in glutathione production which is involved in physiological detoxification at the cellular level. The ability to detoxify toxins and the improved metabolism has a direct influence on those items listed above.
So Why is Methyl - B12 Therapy So Important In Autism?

There are multiple reasons for its effectiveness:

MB-12 works on one of the most important biochemical processes in our bodies called Methylation (and indirectly trans-sulfuration).

Methylation is a biochemical process that is often broken or disrupted in autism. The chemistry of methylation explains a lot with respects to autism such as - lack of environmental awareness, poor focus, attention and eye contact, language issues, immune problems, brain chemistry and detoxification imbalances and more.

MB-12 has been shown for years to be highly effective, and can help individuals of all ages or deficits. Individuals with Attention Deficit (ADD) or other speech/language and neurological disorders can benefit as well – it is not just an intervention for someone diagnosed with autism.
The process of MB-12 injection therapy is simple. Each subcutaneous (underneath the skin) injection is given in the upper outer quadrant of the buttocks every 3 days (to start) using a pre-filled insulin syringe and needle. The procedure is virtually painless. The most difficult part of the process is for the parent/care-giver to overcome their fear of giving an injection. Yes, that's right - Mom, Dad, Grandma or Grandpa - whoever it might be will be giving the injection.

Luckily, there are very good instructions available for performing this procedure (see below). Additional information is available at www.AutismActionPlan.com in the “Methyl-B12 Section”, as well as having direct access to me through the member forum for ongoing questions and answers regarding biomedicine intervention for autism. Also additional information is available at Dr. Neubrander’s website – www.drneubrander.com.

**Methylcobalamin (MB-12)** injections are a prescription item only. They are available from a number of specialized compounding pharmacies such as Hopewell Pharmacy (New Jersey) at 800-792-6670 – www.hopewellrx.com, Wellness Pharmacy (Alabama) at 800-227-2627 – www.wellnesshealth.com, or Lee-Silsby Pharmacy (Illinois) at 800-918-8831 – www.leesilsby.com. Check with each individual pharmacy for insurance billing options, as this may be available to you depending on your particular type of insurance.

The cash price for MB-12 for a 30 day supply is approximately $50 to $60 (not including shipping). Shipping outside the continental U. S. will likely require additional shipping costs.
Each pharmacy will send pre-filled syringes to your home with the exact amount of MB-12. The dose of MB-12 is based on weight, and is dosed at a specific concentration. This is necessary to achieve the therapeutic benefits of MB-12 according to Dr. Neubrander's research (Neubrander article titled - “Methyl-B12: Myth, Masterpiece, or Miracle”)

The picture above represents a size comparison of the MB-12 syringe and needle (picture size not exact as each computer screen will format images differently). As you can see the needle (far right) is very small, especially when compared to the other needles. The MB-12 is dark (burgundy in color). Each syringe is prefilled. The MB-12 dosage is taken from a base concentration of 25,000mcg/ml (25mg/ml). The amount seen in this picture is 1250mcg (micrograms) which is typical for a 35 to 40 pound child.

The injection must be given in the subcutaneous fat of the buttocks. Other "fat" areas, i.e. abdomen, deltoids (shoulder) do not give the same effect.
The reason MB-12 is best given subcutaneously is to obtain a consistent slow release into the bloodstream to maintain adequate levels. If injected into a muscle the MB-12 will be absorbed too rapidly and metabolized quickly out of the body. The injection of subcutaneous MB-12 is based on the same principle as insulin injections. A person who is an insulin-dependent diabetic will inject insulin underneath the skin in the subcutaneous fat to insure consistent blood levels of insulin to best control blood sugar. A diabetic individual does not want rapid fluctuating levels of insulin as blood sugars would become unstable. The same thing applies with MB-12 – you do not want erratic fluctuating levels – otherwise the response seen will too be erratic and inconsistent.

A 30 degree angle or less is best and will ensure that the vitamin is not given in the muscle. If a small bubble (or bump) appears under the skin this is normal as the MB-12 will absorb slowly from this area. This will usually disappear in a few hours.

It is recommended that other biomedical therapies such as beginning heavy metal detoxification, dietary changes, or new supplements NOT be started during the first 6 weeks of MB-12 shots. This is so a true indicator of benefit can be seen without other influences.
It is also recommended that DMG, TMG or Folinic Acid (or L-Methyl-Folate) should not be started at the same time as MB-12 (during the first 6 weeks).

These supplements have been known to increase the potential onset of side effects (see below) if started too early. If a person is taking DMG or Folinic Acid already it is generally okay to continue although it will be important to watch for increased side effect potential (see below). If TMG is being taken, it is highly recommended to discontinue (3 to 5 days) before starting MB-12.

Most individuals (particularly children) respond favorably during the first 6 weeks of treatment, i.e. increased eye contact, language, social interactions, environmental awareness, attention and focusing. However, some may take longer to respond. **It is recommended that this therapy continue for at least 24 to 48 months to achieve optimal results.**
In my experience approximately 60% to 70% of children respond favorably during the first 6 weeks. This means positive changes are happening that are obvious to the parent or caregiver. Approximately, 15% to 20% of children are more subtle in their response and not until the “Parent Designed Report Form” is filled out (see below) that positive changes are recognized. Less than 10% of children do not respond during the first 6 weeks of MB-12 injections.

Any biomedical therapy such as dietary changes, supplements, anti-yeast treatments can cause negative reactions. It is very difficult to tell if a child will react negatively to MB-12 therapy. It is much more likely the child will respond favorably than adversely (clinical experience).

Each child SHOULD have a "Parent Designed Report Form" filled out for them. This document can be obtained from Dr. Neubrander's website at www.drneubrander.com. This form should be filled out at the end of the 1st 6 week cycle. Look under the ‘download’ link on Dr. Neubrander’s website for this document. The importance of this questionnaire cannot be overstated as it helps to identify the positive changes that can occur with MB-12 therapy that sometimes are easily overlooked by casual observation.

Dr. Neubrander reports that side effects such as hyperactivity, stimming, disrupted sleep patterns, and mouthing objects may be necessary in order to see the greatest benefits. However, that does not mean that if these side effects do not occur that benefits will not manifest – clearly there are those individuals who get positive changes without side effect issues. It is reported that if these side effects are seen the parents who "push through" report that the effects eventually lessen and their children greatly improve. These side effects may last anywhere between 2 to 6 months.
In my experience 4 to 8 weeks (6 on average) is more common. If these side effects do occur they usually happen within the first two weeks of therapy. If they occur sometime later (2 to 3 months into MB-12 therapy) they are usually do to something else. Hyperactivity occurs about 60% of the time, sleep disturbance (restlessness) about 40%, and mouthing (child becoming more oral seeking) about 30% of the time in the first 6 weeks.

According to Dr. Neubrander all side effects need to be classified as tolerable versus intolerable. Take hyperactivity for example. A tolerable side effect of hyperactivity may be that a child is more hyperactive at home, but in their therapy sessions they are more focused, and/or more sociable with better eye contact. An intolerable side effect of hyperactivity could be that they are so out of balance, i.e. “bouncing-off the walls 24/7” that they cannot focus at all. Obviously, an individual who becomes aggressive or takes on self-injury behavior may be having an intolerable reaction to the MB-12 and either needs to discontinue or have their dosage adjusted.

According to Dr. Neubrander many individuals improve in 3 major areas - Cerebral Cortex Function (90%), Speech and Language Function (80%), Emotion and Socialization Function (70%) with the use of MB-12.

The injections are given every 72 hours (every 3 days) in the beginning. An initial prescription of #15 to #20 pre-filled syringes is commonly ordered from a qualified compounding pharmacy (see list above). This supply lasts approximately 5 to 6 weeks (enough for the first 6 weeks). The MB-12 is best kept refrigerated. In some cases if the insurance company pays for MB-12 #10 pre-filled syringes will only be approved – this is based on a 30 day supply at one injection every 3 days.

Refill requests should be called to the prescribing pharmacy or prescribing physician’s office. Please allow 72 hours for prescription refill authorization in most cases.
(For Physicians/Health Care Practitioners)

**Dosage Determination: mcg = micrograms**

Calculate weight in kilograms (Kg). Divide pounds (lbs) by dividing by 2.2.

Multiply Kg X 64.5 mcg = MB-12 mcg dose
(for example – 40 lbs child ÷2.2 = 18 kg.  18 X 64.5 = 1172 mcg

Methyl-B12 is only accurately dosed in 250 mcg increments. So for a 1172 mcg dose it is best to round-up to the nearest 250 increment dose = 1500mcg.

When determining dosage a good rule of thumb is the dosage usually changes by 250 mcg for every 6 lbs body weight, and I recommend rounding up instead of down when providing a MB-12 dosage. This is to correct for any errors in dosage concentration.

The pharmacy will provide MB-12 in pre-filled Becton Dickinson 3/10cc insulin syringes - item #328438.

**NOTE:** If you are prescribing this for the first time you should indicate the syringe type and item number.

Hopewell, Lee-Silsby, and Wellness Pharmacy are all very familiar with MB-12 dosing, syringe type, etc.

Methyl-B12 Injections (SQ)

_________ mcg per dose

#_____ pre-filled syringes (B/D 3/10cc insulin – item #328438)

One injection SQ q 3 days (72 hours)

_______# refills

**NOTE:** Methyl-B12 Prescription Handout forms are available through the download section of [www.AutismActionPlan.com](http://www.AutismActionPlan.com). The Methyl-B12 prescription handout (and others like them) can be taken to your personal doctor for their signature and dosage determination. The form is then shipped to a desired specialty pharmacy listed on the form. The process is simple. You must be a member of the [www.AutismActionPlan.com](http://www.AutismActionPlan.com) site to have access to these forms.
This photo shows two syringes of MB-12. These are insulin syringes that contain various amounts of MB-12. The syringe on top contains 5000 mcg which is approximately the amount for a 180lbs (82kgs) individual. The bottom syringe contains 1500 mcg which is approximately the amount for a 45lbs (20.5kgs) child. Each syringe comes pre-filled.
The Methyl-B12 syringe and needle are very small. Each syringe comes pre-filled with the exact amount based on weight. The needle injection is virtually painless. It is given subcutaneous (underneath the skin) in the buttocks. You can see when placed next to an average size pencil the needle is very thin and small.
Once the Methyl-B12 authorization is sent to the pharmacy (and you coordinate with the pharmacy for shipping information and payment), a few days later you will receive a package in the mail. Inside will be a small bag like the one above with the Methyl-B12 syringes inside. Place bag and syringes in the refrigerator to keep cool. The syringes are best used within a 90 day period of time (ideally, no more than 60 days) for optimal effectiveness. Each pharmacy will normally ship the Methyl-B12 with an ice pack to keep cool. However, depending on where you live the Methyl-B12 may not arrive cold. Do not be concerned as my experience over the years has shown the Methyl-B12 is still effective.
An additional item you can have ordered from your physician - either from the same specialized pharmacy dispensing the Methyl-B12 injections, or a local pharmacy in your area - is lidocaine cream. This is a numbing cream that can be applied to the skin where the injection will be given 20 to 30 minutes prior to help numb the area. Even though the injection needle is very small and most individuals (including children) do not feel the injection, some sensitive individuals will feel pressure in the area.
A few other items you will want to have on hand are some Isopropyl Alcohol, a cotton ball or an alcohol prep swab. The cotton ball with applied Isopropyl Alcohol or prep swab can be used to clean the skin prior to injection. If you are applying lidocaine cream then use the alcohol first before applying the cream.
The best area for MB-12 injection is in the subcutaneous tissue (underneath the skin) of the upper outer quadrant of either buttock. The injections can be rotated back and forth between the right and left buttock.
As mentioned before it is a good idea to apply a small application of Isopropyl Alcohol to the skin prior to injection.

If using lidocaine cream it can be applied to the skin as well. Wait approximately 20 to 30 minutes for the skin to numb then you can proceed with the injection. Remember, the lidocaine cream is not a requirement. It is only an option if you feel your child may be very sensitive to the Methyl-B12 injection.
You are now ready to give the injection. Remove the cap and expose the needle.
Before injecting the needle, make sure you have a good grasp of the syringe. The recommended procedure is to hold the syringe between your thumb and middle finger. Your index finger is now free to push down on the needle plunger. Also, hold the needle down near the base to increase the needle stability in your hand. This increases your flexibility to give the injection more comfortably.
Inject the needle at a 30 degree angle or less. This angle will ensure the needle and Methyl-B12 will be deposited subcutaneously (underneath the skin) and not into a muscle. Once the needle is in place, push on the syringe plunger with your index finger to empty the syringe. This process usually takes no longer than 2 to 4 seconds (depending on how much B12 is in the syringe).
In most cases there will be no mark left from the Methyl-B12 injection. However, in some light skinned individuals you may see a slight blemish on the skin. This is normal. Also, a small bubble can appear from where the Methyl-B12 was injected. This is normal as well and in both situations the skin will return to normal in a few days. Because the Methyl-B12 is dark in color and goes underneath the skin you may see its appearance for a few days until it is absorbed completely.
CONGRATULATIONS! You Are Ready To Give Your First Methyl-B12 Injection.

Listed below are few “Don’ts” to keep in mind when doing Methyl-B12 injections.

Don't inject the needle straight into the skin. You want the needle to be at a 30 degree angle or less. If you inject straight in you may infuse the MB-12 into the buttocks muscle. This is not dangerous, but the effectiveness of the MB-12 will be lost too quickly as the vitamin is absorbed and then excreted from the body in a short period of time.
Don't Pinch The Skin Between Your Fingers! When doing this you can mistakenly bring a ribbon of muscle into the skin fold. In this case, even though you inject the needle correctly at 30 degree angle or less you could still hit the buttocks muscle.
Yes, This is the Correct Way!
Instead of pinching the skin, gently fixate the area with your thumb and index finger. Don't stretch the skin too aggressively, just gently hold the area firm and insert the needle.
What are The Common Side Effects of Methyl-B12 Therapy?

The main side effects of MB-12 therapy are as follows (The percentages are based on my personal clinical experience):

Hyperactivity:
Approximately 60%

Sleep Disturbance:
Approximately 40%
The sleep disturbance usually manifest as restless sleep for a short-period of time – 10 to 14 days, or less. If this situation is occurring you can give the injection earlier in the day. In most cases, this problem is not severe and resolves on its own.

Mouthing of objects (fingers, sucking on knuckles, placing other items in mouth) – approximately 30%:
Some kids become more oral seeking when they first start MB-12. I have usually seen this occur in kids who are oral seeking already, or who use to have this behavior in the past. MB-12 seems to have an activating influence on the nerve pathways to the mouth.
How Long Do These Side Effects Last?

The most common side effects – hyperactivity, sleep disturbance and mouthing usually last 4 to 8 weeks – 6 weeks on average.

Normally, if they do not manifest within the first couple of weeks they usually will not appear at all. If these issues manifest some time down the road, i.e. two months - it is commonly from something else.

In some cases, significant adverse behavior such as aggression, irritability, unstable mood, or similar issues can occur. These usually occur less than 10% of the time. Many times giving a wash out period of two weeks, and then restarting at a lower dose, i.e. ½ syringe can help.

Less than 5% of individuals in my experience need to stop the Methyl-B12 all together. Usually, in those that do their autism is more severe, they already have unstable mood issues, and are highly sensitive to supplement and drug therapy.

**Tolerable versus Intolerable** – “positive-negative scenario.” This terminology was coined by Dr. Neubrander and relates to the ratio of beneficial changes with MB-12 such as improved eye contact, greater environmental awareness, more engaged, better comprehensive, language improvements, but at the same time seeing negative changes such as hyperactivity, mouthing issues or sleep disturbance. A typical pattern is for a parent to state, “my son is more hyper at home, but in their therapy sessions they have better comprehensive and language skill. I can live with the hyperness to allow the therapy (MB-12) more time to work.”
Each situation is different. Your particular ‘tolerance’ level for negative reactions is an individual thing. However, if you are seeing positive changes with your child – even if they are subtle – the therapy is working, even if initial negative behavior is present. In many cases, if you give MB-12 enough time the side effects begin to wear off and more positive changes begin to emerge.

**Further Considerations Regarding Side Effects and Behavioral Changes**

**Defiant Behavior** – in some cases kids become more defiant, especially when they are being redirected or told ‘NO.” It is not uncommon for a child on MB-12 to become more willful. This is not necessarily a bad thing. Because MB-12 helps to improve cognitive awareness, some individuals will become more interested in their environment – such as toys, household objects or people. Now, all of sudden a child that was docile and well-behaved is getting more mischievous, and they are not happy being reprimanded.

**More Easily Frustrated** – some individuals, particularly young children who are non-verbal, can appear more easily frustrated. One reason is an increase awareness or desire to communicate – particularly in the early stages of therapy – is often met with their limitations in talking or forming words. A child then becomes agitated because they are not getting their needs met.

**Typical Childhood Behaviors Emerge** – not uncommonly a child will begin to manifest with new behaviors such as tantrums, willfulness, obstinacy and others. You have to be aware that many childhood behaviors like this can be typical for their age, and try to decipher what is autism, and what is typical childhood behavior. In some cases you may have a child who is 4 to 5 years old who is now manifesting with ‘terrible two’ behavior. Even though in physical age they are growing, behaviorally they may be stunted in development. There is a natural catch-up phase some kids have to go through.
There are many examples like these with the use of MB-12. If you are using MB-12 therapy for your child there is likely going to be an adjustment period they will have to go through. Not all changes will occur at once. Some kids respond very quickly to therapy, while others it is a more slow paced change. Be patient, and allow for the therapy to work over time. Also, recognize that not all behavior is an adverse reaction (as discussed above).

However, if an individual – whether child, teenager or adult – becomes combative, aggressive and a danger to themselves or others, then the therapy should be stopped and discussed with their physician. The neurological and biochemical components of autism are complex and for many individuals any therapy – whether it is a pharmaceutical drug or nutritional supplement – can have profound changes on their brain chemistry.

In my experience, I have never seen a person have a toxic reaction to Methyl-B12. I have had to stop the therapy on occasion because a child has become over-stimulated and agitated. However, this reaction is generally short-lived, and after a wash out period of a few days (on occasion 7 to 14 days) the situation is resolved.

For more discussion regarding these issues please visit Dr. Neubrander’s website at www.dr.neubrander.com. Also, you can become a member of www.AutismActionPlan.com and have direct access to me via the member (Parent) forum for ongoing questions and answers regarding biomedical intervention for autism. There is more information about Methyl-B12 and other topics related to biomedical intervention as well.

An excellent article on metabolic markers regarding methylation defects is available online. Copy and paste in search window through your particular browser the following “**metabolic biomarkers of increased oxidative stress and impaired methylation capacity in children with autism**” You can also reference the article for more in-depth information:

Trouble Shooting Methyl-B12 Therapy

Watch for 72 Hour Consistency Between Shots:
Remember – to begin, the injections are given every 72 hours (every 3 days). What you want to watch for is the consistency in positive benefits from one injection to the next. For example, does your child maintain their improved eye contact, better awareness, improved focus and concentration, etc. through the three days, or do they have a drop-off 12 to 24 hours before the next injection? If you are seeing a drop-off then it could indicate your child may benefit with an every 48 hour dosing cycle. Another consideration is the injection angle of the Methyl-B12 – which should be 30 degrees of less.

If the injection angle is okay, and not too deep and you still see 36 to 48 hour benefits with a 12 to 24 hour drop-off before the next injection than the every other day dosing is warranted.

Quick Onset Hyperactivity:
Your child may need a smaller dose of MB12. Another consideration is the injection of the needle is too deep and the MB-12 is being placed into muscle. This can even happen if a person has very little subcutaneous fat. Also, remember not to pucker the skin between your fingers. One suggestion for lessoning the dose is have the prescription adjusted downward by \( \frac{1}{4} \) to \( \frac{1}{2} \) the amount, or just administering \( \frac{1}{2} \) of what is in the syringe instead of the full amount.

Immediate Positives, i.e. Eye Contact, Attention And Then Quickly Lost:
The likely scenario is the injection is too deep. Try to get the needle angle more flush with the skin when injecting.
Red/Pink Urine:
The needle is going too deep and hitting muscle. If you check your injection angle and do not feel you can injection the MB-12 anymore flush with the skin, then your child’s body is likely releasing the MB-12 very quickly from the depot area. In some cases there is not much more that you can do. Each individual’s skin is unique. Also, if they are thin with very little subcutaneous tissue your child’s urine may always appear slightly pink.

Itching, bruising, skin discoloration:
Some individuals experience a slight discomfort when the MB-12 is first injected. This likely has to do with the acidity of the MB-12 itself. The subcutaneous tissue in some individuals is very sensitive and can react with itching for a few minutes after the injection. Applying some ice to the area can help. If the itching continues some topical Benadryl lotion typically is helpful.

Occasionally, a person can develop a little bruising around the injection site. Again, individuals with very sensitive skin are more prone to this. It is not dangerous and usually clears up in a few days. It is fine to move the needle injections to other locations on the buttocks. The injection does not always have to be given in the exact same location or on the same buttocks every time.

Skin discoloration can appear from time to time underneath the injection site. The MB-12 is very dark red in color, so depending on skin pigmentation or the deepness of injection the vitamin can be seen underneath the skin in some cases. Once the MB-12 absorbs into the body the discoloration usually disappears.
**Hyperactivity with Methyl-B12:**

In some cases children receive a tremendous benefit for MB-12, but they still remain hyper. The incorporation of Folinic Acid (FA) 400mcg to 800mcg can be helpful. FA in some kids helps to diminish the hyperactivity.

Another option is to administer L-Methyl-Folate instead of the Folinic Acid. Even though the two are similar, L-Methyl-Folate is the physiological active form of folate and may be more effective than Folinic Acid. Typically, a 1000mcg dose is sufficient in most circumstances.

In some cases I have seen the addition of the amino acid Taurine helpful, in addition to the Folinic Acid or L-Methyl-Folate. Typically, 250mg to 500mg daily is all that is needed.
Other Methyl-B12 Adjustments To Consider:

In some cases children’s hyperactivity is not remedied by administering Folinic Acid or L-Methyl-Folate (or the addition of Taurine) orally. In these rare circumstances some children seem to do better when the Folinic Acid is added directly to the Methyl-b12 syringe. An example of this would be for your prescribing doctor to write for Methyl-B12 with additional 100mcg to 400mcg, along with the prescribed amount of methylcobalamin. On average, 300mcg seems to work fine.

However, one thing that must be realized is that anytime you add an ingredient to the Methyl-B12 syringe the base concentration (25mg/ml) will change, i.e. 12.5mg/ml, 6.25mg/ml. I personally prefer to dose Folinic Acid orally if possible.

Some doctors also like to add N-acetyl-cysteine (NAC) – a promoter of glutathione – to the Methyl-B12 syringe as well. I personally try to avoid this as it too will alter the base concentration of Methyl-B12. Remember, it is the 25mg/ml (25,000mcg/ml) concentration that has been shown to be most effective through clinical experience over the years via Jim Neubrander, M.D.’s work on Methyl-B12 therapy for autism. My experience has followed suit with Dr. Neubrander.
What About Other Forms of Vitamin B12?

There are other forms of vitamin B12. It turns out that methylcobalamin is the form most influential on the Methionine Synthase converting enzyme for homocysteine to methionine conversion. However, understanding the role of other B12’s is worthwhile:

**Adenosylcobalamin (and Methylcobalamin)** – are the “active” (coenzyme) forms of the B12 family – naturally produced in the body.

**Hydroxycobalamin** and **Cyanocobalamin** – are the two precursor forms of B12 family. Hydroxycobalamin is the most commonly used pharmaceutical version. It can convert into “active” forms.

If digestive function is working properly than the need for these is not likely necessary. However, with often compromised gut function in autism these become compromised and adenosyl and methylcobalamin seem to be more functional.

**Adenosylcobalamin** – usually does not show much clinical response relative to Methyl-B12. However, it can be used if Methyl-Malonic Acid (MMA) is high and/or there is evidence of mitochondrial dysfunction. Methyl-Malonyl-CoA is converted into Succinyl-CoA for Kreb Cycle function. If this reaction doesn’t occur MMA can increase abnormally and lead to ammonia toxicity and encephalopathy.

**Hydroxycobalamin** – another form of B12 that seems to help some kids on the autism-spectrum. Consider using if Methyl-B12
is not tolerated or a plateau effect has occurred and the child is not responsive to Methyl-B12 dosage changes.

Dosage for Hydroxy-B12 – does the same as Methyl-B12 – 64.5mcg/kg every 3 days. The prescription is written exactly the same as is done for Methyl-B12.

Hydroxy-B12 is known to help with nitric oxide regulation and reactive oxygen species. This has been shown to help individuals with chemical sensitivity and chronic fatigue.
Methyl-B12 Therapy – Additional Options To The Injections

As I have described throughout this book it is my personal preference to administer Methyl-B12 through a subcutaneous injection route in the upper outer quadrant of either buttocks. However, I also recognize the difficulty in having this done either because of logistical problems in obtaining Methyl-B12 injections, or tremendous anxiety and fear of the child receiving the injection. Therefore, there are some additional options which can be considered, and have actually worked fairly well for a wide variety of individuals.

**Oral Forms:**

New Beginnings Nutritionals – [www.nbnus.com](http://www.nbnus.com) – carries a product called Methyl-Mate. It is an oral liquid methylcobalamin. The product description is listed below:

"**New Beginnings Nutritionals has formulated a product called Methyl-Mate which provides an ultra-concentrated (1 ml – 5000 mcg) form of methylcobalamin which contains no flavorings or artificial preservatives.**

**Suggested Dosage:** as a dietary supplement take 5 drops per day or as suggested by your physician. For best results, hold in the mouth, preferably under the tongue, for one minute before swallowing. For young children, a few drops at a time can be squirted under the tongue to allow for more effective absorption."
NOTE: I cannot provide a specific dosage of Methyl-Mate orally (or for other forms of methylcobalamin that are found as supplements such as powder, sublingual tablets, or sublingual sprays) that equates to what would be dosed via the subcutaneous injections. Because each person’s digestive capacity is different, the best thing to do is follow the dosing suggestions set forth by the supplement distributor or pharmacy selling the product and then coordinate the dosing with your personal physician.

**RevitaPOP** –
[www.revitapop.com](http://www.revitapop.com) - is an interesting supplement. It is an oral form of methylcobalamin delivered via a lollipop – which makes it a hit with some kids! Each lollipop contains approximately 3.6mg of methylcobalamin. Even though the Institutes of Medicine have not established an upper limit for vitamin B12 dosing on a daily basis the use of a product like RevitaPOP is best done in the beginning on a once daily basis. I will commonly have kids do one lollipop daily, and then after a few weeks consider increasing to one twice daily depending on overall response.

In my experience, RevitaPOP has worked fairly well for kids not able to do the injections, and the overall parent response has been positive.
Nasal Spray:
Methyl-Mate from New Beginnings described above is an oral liquid methylcobalamin product. However, it is possible to convert Methyl-Mate into a nasal spray. Typically, the dosing of a nasal spray for methylcobalamin is variable, and is really based more on clinical response versus dosing based on weight. Therefore, it is difficult to give a precise dosing recommendation like has been established for the Methyl-B12 injections. Generally, I recommend starting with one spray per nostril daily for 1 to 2 weeks, then increase to 3 to 4 sprays daily. The nasal spray is best given all at once, but can be spread throughout the day as well if desired. Because the nasal spray is absorbed more readily than the subcutaneous injection form of Methyl-B12 it is commonly done daily (instead of every 72 hours like the injections). However, in some children or adults who feel overstimulated from the nasal spray it can be done every other day.

To convert the Methyl-Mate into a nasal spray you must obtain the nasal applicator from New Beginnings – www.nbnus.com. When placing your order for Methyl-Mate also request a nasal applicator to be sent along with the bottle. Then take out the dropper cap and replace it with the nasal applicator cap. At this point, the bottle of Methyl-Mate is converted into a nasal spray bottle and each spray is approximately 500mcg of methylcobalamin.

There is one final comment on the nasal spray of Methyl-B12. Many young children do not like things sprayed up their nose. Therefore, doing a nasal spray may prove difficult, just like doing a subcutaneous injection. In these circumstances I would personally opt for an oral form as either a sublingual spray, tablet, or lollipop.
A Message From Dr. Woeller...

As you can see the information regarding Methylcobalamin for autism is in-depth and complex. There has been a tremendous amount of scientific information that has been gained over the past decade with respects to its use, and much that we as health practitioners in utilizing this therapy have garnered as well. Methylcobalamin, like many other biomedical therapies, works very well for many individuals on the autism-spectrum. Although, it shouldn’t be viewed as a ‘magic bullet’ therapy (meaning the only thing that you would want to use), it does hold a lot of hope for improved cognitive and neurological function for those who do try it. There are many cases of dramatic changes that have occurred with its use and it is my sincere hope that your loved one with autism will be one of them.

The best advice that I can give is to be open-minded to the potential benefit of Methyl-B12 therapy and pursue it (with the guidance of your personal health practitioner) with persistence and patience. It is not an intervention that should be implemented for just a few weeks to determine whether it is helping or not. At least a 2 to 3 month trial is necessary, and the long-term use (1 to 2+ years) in my experience often manifests with great benefits as outlined previously in the book.

I wish you great success in helping your loved one with autism.
Sincerely,
Dr. Kurt N. Woeller

References:
Meet Dr. Woeller

Dr. Kurt N. Woeller has been a biomedical medicine specialist and complementary medicine physician since 1998. He is an author, lecturer, and clinical practitioner with over 15+ years working in the field of biomedical autism intervention. He offers in-person consults in California and Oregon. Dr. Woeller is also available for phone and internet consults (Skype) regarding autism and other health issues.

He provides specialized testing and therapy options for individuals with complex medical conditions like rheumatoid arthritis, chronic fatigue and fibromyalgia, mental health problems, multiple sclerosis (and other chronic neurological problems), autism, and other chronic degenerative disorders. Dr. Woeller serves as a clinical consultant for Great Plains Laboratory and BioHealth Laboratory – two unique laboratory companies offering specialized testing for individuals with complex medical disorders.

Dr. Woeller has lectured throughout the United States and abroad regarding the benefits of complementary therapies. He maintains an extensive online educational resource for patients and family members of individuals with chronic health disorders.
Private Consultations With Dr. Woeller

Dr. Woeller’s popular information website for autism – www.AutismActionPlan.com - has 100’s of members from around the world who access him daily for questions regarding integrative medicine for autism and related disorders. For more general information about Dr. Woeller visit his main website at www.DrWoeller.com.

To schedule a private consultation with Dr. Woeller please email info@mysunrisecenter.com or call 951-461-4800.
Please Note:

The material contained within this document is not intended to replace the services and/or medical advice of a licensed health care practitioner, nor is it meant to encourage diagnosis and treatment of illness, disease, or other medical problems.

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