

## Methyl B12 Injections:

### EXTRA INFO AND KEY POINTS UNDERLYING SUCCESS OR FAILURE:

- a) *All types of fat are not equal and different types of fats have different dissolution and dispersion constants.* From my studies, the fat from the region of the buttocks significantly outperforms the results of injections made into the fat of the arms, legs, or belly.
- b) Because my clinical research indicates *the methyl-B<sub>12</sub> phenomenon is due to a dependency condition, not a deficiency syndrome*, subcutaneous injections into the fat of the buttocks allows for a leaching effect that can provide a “24/7” slow release into the tissues. By contrast, injections into muscle quickly saturate B<sub>12</sub> receptors, correct any deficiency that may be occurring, and temporarily treat any dependency that is also present. After the B<sub>12</sub> receptors are saturated, the excess methyl-B<sub>12</sub> not bound to receptors will be filtered from the blood by the kidneys and excreted into the urine within 30-45 minutes after the injection. If the volume of the red methyl-B<sub>12</sub> shot is large enough, the next urine specimen will be red or it will be some color of red depending on the concentration of the urine. If, however, the volume of the red methyl-B<sub>12</sub> shot is small, the urine will not show red or pink even though the methyl-B<sub>12</sub> is filtered through the kidney into the urine within the same 30-45 minutes after being injected. Unfortunately the effects of intramuscular injections are quite confusing to parents and clinicians. Many children will show a response to some degree, often to a very noticeable degree. However, when compared to subcutaneous shots to the buttocks, the duration of the response is shorter; the intensity of the response, over time, will be less; and because of this combination of factors, many parents will discontinue shots months prematurely before realizing the full effect of methyl-B<sub>12</sub> for their child. A couple of additional points must be made about intramuscular injections. Should you give your child a shot and see a response within minutes or a couple hours instead of many hours to days, you are giving the injections intramuscularly. Subcutaneous adipose tissue in the buttocks is not vascular enough to deliver enough methyl-B<sub>12</sub> fast enough to produce a significant clinical response in such a short period of time. If my dosing schedule is being followed and you see that the urine is pink or red, the methyl-B<sub>12</sub> shot was undoubtedly delivered into the muscle no matter how much you believe the injection was given subcutaneously. Subcutaneous injections cannot deliver enough “red” methyl-B<sub>12</sub> fast enough to be cleared by the kidney and show red in the urine unless the volumes are huge, significantly greater than any that I commonly use.
- c) Because of the above discussions, *a constant steady state can be achieved in most individuals with a shot frequency being adequate once every three days if fat from the child’s buttocks is used.* I use the following example, not to be gross or disgusting, but rather because it allows you to easily visualize and remember the concept. To visualize what happens to a methyl-B<sub>12</sub> shot in the fat in the buttocks may be hard to do unless we ‘magnify it’. Therefore, let’s think about an “elephant’s butt” instead. Let’s say there are 12 inches of fat between the skin and the muscle below. Our goal is to insert a red lollipop right in the middle of this foot of elephant butt fat – 6 inches under the skin and 6 inches above the muscle. Because fat is moist and because lollipops dissolve whenever they come in contact with moisture, imagine the diameter of the lollipop gradually getting smaller and smaller until it is totally gone 3 days later. This is analogous to injecting a dense concentration of methyl-B<sub>12</sub> into the subcutaneous fat in a child’s buttocks – a process of slow steady release over 3 days. By contrast let’s revisit the elephant’s butt and insert the lollipop in the muscle. Because muscle has lymph and blood constantly in motion, the lollipop continually has blood and lymph “washing over it” and the lollipop will dissolve much more quickly, similar to what would happen if it were in a bowl of water that was gently being rocked back and forth. As this illustration shows, the lollipop in the bowl will be completely melted within an hour. Should the lollipop have been inserted right at or very close to the subcutaneous/muscular junction, an effect somewhere in between the two extremes would be noted.
- d) Clinically speaking, methyl-B<sub>12</sub> injections, when truly delivered into fatty tissue in the buttocks, appear to disperse over a 3-day period “on average”. Therefore, the first place you need to look when the benefits of a methyl-B<sub>12</sub> shot seems to wear off too soon is to retry the shots at the same dose and frequency but make the angle of attack much more severe, much closer to the horizontal plane, just under the skin. In children

that are extremely thin or extremely young that have essentially no fatty tissue on their buttocks, I have found that injections given every day or every-other-day, still just under the skin, seem to overcome the problem and allow the benefits of methyl-B<sub>12</sub> to be seen. However, I do not keep the dose the same. Instead I make the dose of each shot proportionately less depending on whether it is given every other day or every day. For example, a dose of 750 mcg per shot every 3 days is equivalent to a shot of 500 mcg given every other day and equivalent to a shot of 250 mcg given daily.

e) **Common errors in technique:**

- a. *Pinching the fat:* Professionals often teach parents to “pinch the fat” to give a subcutaneous injection. Unfortunately with small children, the “tenting effect” that occurs not only brings with it subcutaneous fatty tissue but also “a ribbon of muscle” that is just as likely, if not more likely to receive the medication that is thought to be being administered into the subcutaneous tissue. The discussion above has already shown that in my clinical experience intramuscular injections are significantly inferior to those received in the fat in the buttocks. Therefore, **NEVER PINCH THE FAT** to insure a subcutaneous injection. Instead, go as shallow as necessary, often just under the skin in order to deliver the methyl-B<sub>12</sub> into subcutaneous tissue.
- b. *Angle of injection too vertical:* As discussed above in detail, the angle of injection may not be severe enough in young children who have very little fat to deal with in order to hit fatty tissue and not muscle. Therefore, the thinner the child, the more closely the angle of the shot should be to the horizontal than the vertical plane as it enters the skin. At times you may need to inject just under the surface of the skin to accomplish this goal.

f) **Angles and Safety issues:**

- a. *The safety of the shots is unquestioned if administered from a BD #328438 needle.* This needle is only 8 mm in length and when the shot is given at a 30 degree or less, as is the technique taught, the “effective length” is only a small fraction of the original 8 mm length.
- b. Clinicians have always taught patients to use the upper outer quadrant of the buttocks to avoid injury to the sciatic nerve that could be reached if a regular sized needle was used in the lower portion of the buttocks. However, with the BD #328438 extremely short needle length of 8 mm, even if injected “straight in” over the area of the sciatic nerve, the chances of hitting it in anyone except the smallest preemie is impossible. With the angle of injection being anything significant, *it is impossible to hit the sciatic nerve.*
- c. By applying simple trigonometry, one of the professionals whose child is a patient of mine gave me this “rule of thumb” if a BD #328438 needle is used as per my protocol: a) shots injected at a 30 degree angle give an effective needle length of approximately 4 mm ; b) shots injected at a 20 degree angle give an effective needle length of approximately 2.7 mm ; c) shots injected at a 10 degree angle give an effective needle length of approximately 1.4 mm.