

Nutrition and Mental Health: Professional Issues and Ethics



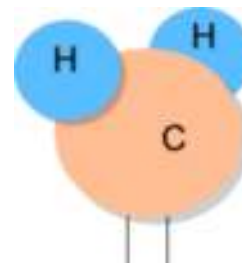
The Methylation Cycle



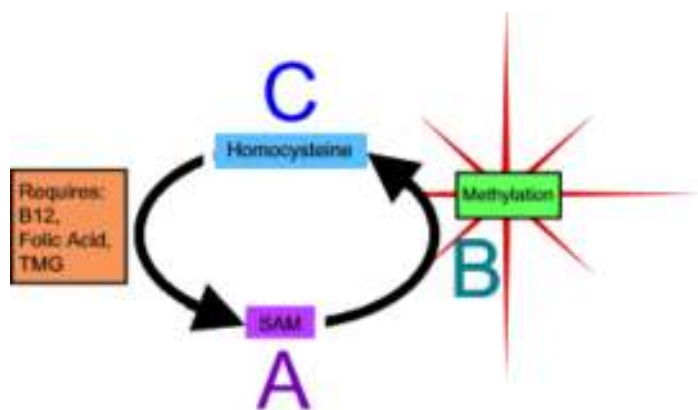
The second Key. So far we have reviewed some specific supplements that help relieve depression. We discussed each in isolation. But we haven't talked about that second Golden Key yet. This Key brings many of the puzzle pieces solidly together, making things simpler. It explains why certain vitamins, minerals, and other nutrients can reduce depression.

What is this concept? It's called the Methylation Cycle, and it's a rather complex topic. Fortunately, we can vastly oversimplify it and still gain all the understanding we need! With the goal of simplification in mind we now present ...

A Mickey Mouse explanation of the Methylation Cycle. As we have seen, the body makes different neurotransmitters out of particular amino acids. To do this, it usually changes the amino acid slightly. It does this mostly by sticking one or more methyl groups onto the amino acid. This is called Methylation.



A methyl group is one carbon (C) atom with two hydrogen (H) atoms stuck on it. The result looks a bit like Mickey Mouse -- a big round thing (the face) with two smaller round things (the ears) at the top. The body can't make methyl groups out of nothing. So it has to have a supply of these units to work with. The Methylation Cycle is the body's way of supplying these methyl groups. The diagram below is a simplified view of the Methylation Cycle. Let's see how it works.



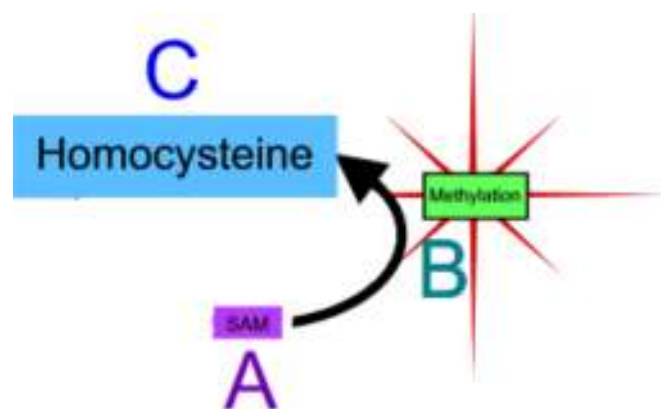
From A to B. The Methylation Cycle carries methyl groups around the body like railcars on a circular track. Because the track goes around in a circle, we could start anywhere. But let's start at the bottom, at point A. There a methyl group is attached to a molecule called SAM. The SAM molecule carries the methyl group to the place where it will be used -- point B. When it gets there methylation happens. Methylation is just a word meaning that the methyl group is popped off the SAM molecule and stuck on an amino acid to make a neurotransmitter.

From B to C. What happens to the SAM molecule when the methyl group is taken off? When the methyl group is gone, the molecule is not SAM anymore. It turns into a different molecule called Homocysteine. Now we've moved from point A all the way to point C.

From C back to A. Here's where things get tricky. The body normally recycles Homocysteine back into SAM -- from point C back to point A. A new methyl group is added to turn the molecule back into SAM

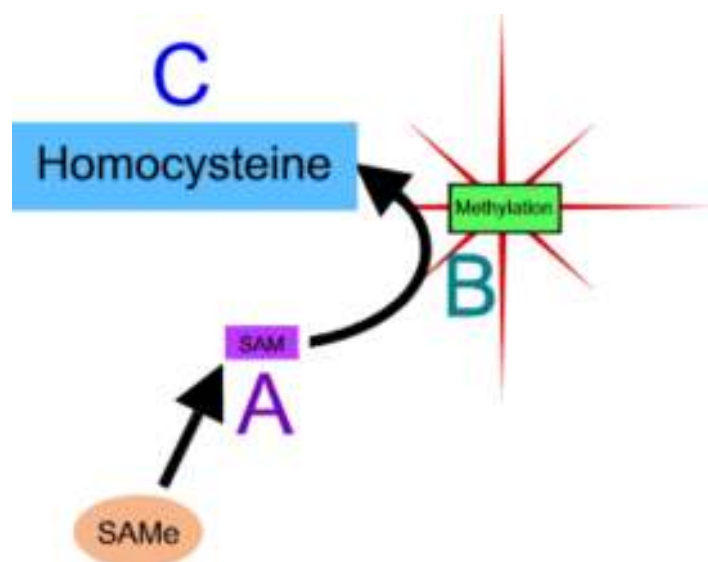
again. Then the cycle is complete. The molecule goes round and round -- **A-B-C-A-B-C-A-B-C**, etc -- carrying methyl groups where they are needed. That's why we call it a Cycle. But that can happen only if there's enough of certain vitamins and nutrients around -- vitamin B12, folic acid, and a nutrient called TMG. These things enable the recycling. They have to be present, or the Homocysteine can't be changed back into SAM.

A depressing shortage. So what happens if the required nutrients just aren't there? Look at the diagram to the right. The Homocysteine doesn't get recycled. Instead, it simply piles up at point **C** unchanged. Big dollops of it accumulate. Because Homocysteine isn't being changed back into SAM, a shortage of SAM soon develops. And when there is a shortage of SAM, not as many neurotransmitters are made. So soon there is a shortage of neurotransmitters, too. The shortage includes Serotonin and Norepinephrine, those anti-depression neurotransmitters. A "chemical imbalance" -- the very kind the antidepressant ads talk about -- has appeared. The individual gets depressed.



Insight! Now we see why deficiencies of specific vitamins and minerals can lead to depression. The shortages tied to depression are of the very nutrients required to keep SAM circulating. When they aren't there, the SAM dries up. That's why supplementing with those vitamins and minerals can help with depression.

Why SAME works. Understanding the Methylation Cycle also helps us understand why the supplement SAME can help relieve depression.



SAME is a special form of SAM designed to be taken orally. Taking SAME increases the available supply of SAM in the body. That leads to increased methylation, and so to increased production of neurotransmitters. It quickly revs up the methylation process to bring neurotransmitter production back up. That can quickly relieve depression.

SAME doesn't help with recycling Homocysteine, though. That substance continues to build up. Even so, supplementing with SAME can provide a band-aid solution. It can power up methylation until something can be done to bring Homocysteine recycling back to normal.

The real fix. If SAME is just a band-aid solution, what's the real fix? The only way to restore the Methylation Cycle to normal is to provide adequate vitamins and nutrients to recycle all the homocysteine that's lying around. Is this hard to do? Not at all! The individual just needs to take therapeutic amounts of vitamins B-12, Folic Acid, and TMG. There is no particular hazard associated with use of these supplements. Improvement may take a couple of months, but that's how it's done.

Ethics Is this the end of the methylation story? Hardly. There are weighty ethical issues at play here. One of them flows from this fact: Neurotransmitters are not the only things impacted by poor methylation. It's a basic process that affects the functioning of the body in multiple areas. Low methylation levels are associated not only with depression, but with cardiovascular disease, arthritis, and several other serious health problems. Some of these can be debilitating and/or life-threatening. For example, high levels of Homocysteine have been associated with increased risk of heart attack and stroke. Many experts think Homocysteine itself is toxic. Others feel it's just a marker for poor methylation. But either way it signals trouble. High Homocysteine levels need to be fixed, not covered up.

Suppose our client's depression is rooted in poor methylation. Her health is already impaired. In this case an antidepressant medication will at best cover up the symptom. It will do nothing to improve her methylation. Failure to address the basic problem may well lead to a further decline in her health. In some cases it will lead to serious health problems.

Our clients rightly regard us as experts in mental and emotional dysfunction. Are we providing the best service when we fail to recognize the true source of our client's suffering? Do we have a responsibility to gain a basic understanding of methylation, this common cause of depression? Can we conscientiously participate in covering up a serious physical problem by masking symptoms with antidepressants?

A second ethical issue relates directly to our responsibility to provide effective treatment. If a client is suffering from depression due to inadequate methylation, it is unlikely that counseling or psychotherapy (or pharmaceuticals, for that matter) will provide lasting benefit. Are we on shaky ethical ground when we provide services we have reason to believe will not be very helpful?

NOTE: For purposes of our discussion we have drastically simplified the Methylation Cycle. We kept the basic idea, but eliminated all the messy details. In fact, we left out most of the steps in the Cycle! If you're interested, you can view a more realistic diagram of the Methylation Cycle [here](#). Readers who wish to go beyond our "Mickey Mouse" presentation may find the following book helpful.



Further reading: For a more complete -- but still pretty simple -- exploration of the topic of methylation, read Craig Cooney's book *Methyl Magic: Maximum health through methylation*. Book is out of print, but used copies are still available at low cost.



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