

HOW ORTHOMOLECULAR MEDICINE CAN HELP

contributed by Dr. Abram Hoffer

Many people suffer depression so severe and for such a long time that it forces them to ask for medical care. Over fifty years ago, only people with severe cases of depression or melancholia sought help. They were often admitted to psychiatric hospitals where there was little help until the first effective treatment, called electroconvulsive therapy, was discovered. Psychotherapy and psychoanalysis were tried on a large scale but proved futile for most depressed patients, and their suicide rate remained high. There was little effective treatment for severe clinical depression until psychiatry entered its chemical age and the first antidepressant called imipramine was discovered in Europe.

We are still in this chemical treatment era except that now we have dozens of different antidepressants. Each modern one is said to be better than the preceding ones. “Better” means fewer side effects, but on a comparative basis, there is little evidence that newer antidepressants are more effective in alleviating depression. Antidepressants work best when used together with a sympathetic form of medical guidance or psychotherapy. This approach to depression is used by many physicians.

Because there are no laboratory diagnostic tests for depression, it is difficult to distinguish it from other medical conditions in which symptoms of depression are a major problem. Schizophrenic patients are invariably depressed, as are many patients with serious or debilitating physical diseases such as cancer, chronic fatigue and many more. Furthermore, the word *depression* is given too heavy a burden when it is used to describe conditions that have no similarity to each other. Thus if you fall and stub your toe, you may be momentarily depressed. If you fail an exam which meant something to you, you might become depressed for longer than that. If your spouse or parent or child dies, the experience of depression called mourning may last for several years. These “depressions” are different from each other and require different ways of being helped. Just as the Innu have many words to describe the different types of snow, we need many different words to correctly characterize the various conditions of depression. An expanded vocabulary for depression would remove from the word *depression* its heavy burden of describing every person who is medically unwell, sad, tired, clinically depressed, and so on.

The main problem in treating depression has been, and still is, to diagnose

it properly so that each group of patients with depression is homogeneous, and to have treatments that are specific and effective for each type of depression. I do not know when modern psychiatry will improve the specificity and effectiveness of caregiving for depression, nor do we yet have restorative care for depression – except for the new upstart branch of medicine called orthomolecular medicine and psychiatry. What, then, is orthomolecular medicine, how did it get started, and why was it so helpful to Robert Sealey, who did not recover from his mood disorder until he began, mostly on his own, to practise its principles?

Orthomolecular medicine started in Saskatchewan in 1952 when Dr. H. Osmond and I gave large amounts of niacin (vitamin B-3) and ascorbic acid (vitamin C) to a catatonic schizophrenia named “Ken” in the Saskatchewan Hospital in Weyburn. We had just received our supply of these vitamins from Merck and Company in order to try them as a treatment for schizophrenia. This was based upon our adrenochrome hypothesis in which we suggested that these patients were sick, not because they were bad or evil, or had bad or evil mothers, but because they produced chemicals or poisons in their bodies which caused perceptual distortions and other problems in their brains (like LSD or hallucinogenic drugs do).

Ken, age 22, did not respond to insulin coma treatment or ECT (then typical treatments for catatonic schizophrenia) and he was dying in his coma. Since he could not swallow, Dr. Osmond and I used a tube to pour 10 grams of vitamin B-3 and 5 grams of vitamin C directly into Ken’s stomach. The second day he was able to sit up and drink a solution which had 3,000 mg of vitamin B-3 (niacin) and 3,000 mg of vitamin C (ascorbic acid). By the end of 30 days on the same daily dose, he was normal. We discharged him. This was the first clinical test of our therapeutic hypothesis that a patient’s schizophrenic brain disorder could be effectively treated by using supplements of two vitamins, normally vital amine nutrients for healthy human beings. Dr. Osmond and I believed that supplements of vitamins B-3 and C would reduce the hallucinogenic levels of adrenochrome which we believed accumulated in the brains of some schizophrenic patients. We were lucky that our hypothesis worked and Ken got well.

Encouraged by this, we gave the same treatment to eight additional patients in two hospitals and they recovered. This is called a pilot trial. Such a small test is designed to measure the best dose range and look for any side effects. I was not very worried about side effects of niacin since I knew that water soluble vitamins were extraordinarily safe. Toxicity tests in dogs showed that 5 grams of niacin per kilogram of body weight would kill half of them. A test dog weighing 20 kg would get 100 grams of niacin. The

dose that kills 50% of the test animals is called the LD 50. That dose would be equivalent to giving a 30 kg child 150 grams of niacin and a 60 kg adult 300 grams (more than one half a pound) every day. Anyone who swallowed that much niacin would probably vomit it promptly back up. Our treatments typically use 3 to 6 gram doses of niacin. This is nowhere near the LD dose. One of my female patients took, as a suicide gesture, two hundred 1/2 gram (=500 mg) tablets of vitamin B-3. Before she began to take vitamin B-3 as directed – at the rate of 2 tablets, 3 times a day – she became angry at her mother and swallowed the whole bottleful. For the next three days, she complained of stomach ache but then had no further complaints. She eventually recovered from her schizophrenia.

Dr. Osmond and I used our scientific knowledge of the life science of biochemistry to develop reasons why supplements might be effective treatments for schizophrenia. We began our search for a restorative treatment for schizophrenia by looking at 3 to 6 gram doses of vitamin B-3 and matching doses of vitamin C. We then applied to Ottawa for a research grant so that we could run a larger scale clinical study. We were advised that we must do the trial using a double dummy design. This was later called double blind. It meant that the patients to be tested would be divided by random selection into two groups: half would be given a placebo (an inert substance) and the other half, the vitamins being tested. These patients were not chronic mental hospital back ward patients. They were ill for the first time or had had several attacks with remissions. For this type of patient, the generally recognized recovery rate is about 35 percent. No one, including the patients involved in a double blind study, would know whether they were getting placebo or vitamins. We agreed to the conditions of this study and as a result, by 1960, we conducted the first six double blind controlled experiments in psychiatry. Since you cannot hide the effect of the niacin flush, we added a hidden group who were given a form of vitamin B-3 called niacinamide which does not cause any flush. We found that the two-year recovery rate using the vitamin therapy was 75 percent compared to the 35 percent recovery using the placebo.

These positive clinical trials and the experience gained by many hundreds of other patients treated outside of the controlled trails convinced me that the addition of this vitamin to the standard treatment of that day would markedly improve the therapeutic outcome. Based on our experiences, we asked my sister Fannie Kahan to rewrite the book, *How to Live With Schizophrenia*, which was based on the earlier drafts of this book that Humphry Osmond and I had written. We asked her to take our final manuscript and rewrite it into plain English comprehensible to the aver-

age twelve year old. This book helped our patients to understand their treatment.

A few years later, the Committee on Therapy of the American Schizophrenia Association was established. It involved over a dozen physicians, mostly psychiatrists. They became the pioneer doctors who rapidly expanded the use of vitamin treatment. As the early pioneers of orthomolecular medicine, they trained many other doctors in North America.

Dr. Linus Pauling, a PhD biochemist, happened to read *How to Live With Schizophrenia* one weekend while he was visiting friends. He was astonished by the fact that we were giving huge (megavitamin) doses of vitamins, up to 1000 times more than the RDA (recommended daily allowance). He soon gave up his plans to retire and accepted a position at the University of California in San Diego, California. He started receiving letters from patients after they were treated with vitamins and recovered. In 1968 Dr. Pauling published his important work, "Orthomolecular Psychiatry," in *Science* magazine where he showed how large doses of vitamins could be helpful. Above all, he emphasized the importance of working with molecules – substances – that were normally present in the human body. Our work coincided with his earlier work with sickle cell anaemia which was the first molecular disease to be described. Dr. Pauling's paper launched the orthomolecular medical movement and embroiled him in a major controversy for the next 30 years of his life. His credibility was attacked by every established health group including physicians, psychologists, nutritionists, social workers and even some government departments.

The Committee of Therapy, after long discussions, decided to adopt his word *orthomolecular* as the one word which best described what we were doing. Now over thirty years later, the word is well established outside of the United States and Canada. In these two countries where the research was done, there is still major reluctance to use the word. Some orthomolecular medical practitioners in North America are still looked upon as strange or labelled as quacks. This does not make sense since these doctors are only applying the life science of biochemistry to the art of medicine. Internationally, orthomolecular medicine is spreading quickly. The International Society of Orthomolecular Medicine has seventeen member countries. It is expanding into Europe, South America, Japan and Korea.

As defined by Linus Pauling, PhD, and accepted by the Committee on Therapy of the American Schizophrenia Association and later the Huxley Institute of Biosocial Research, orthomolecular medicine is a system of medicine which depends heavily on the therapeutic use of natural sub-

stances which are normally present in the human body. These are the vitamins, minerals, essential fatty acids, enzymes, hormones such as insulin and melatonin, and other compounds. Note that hormone therapy has been used in general medicine for a long time. The main emphasis of orthomolecular medicine is on compounds that are present in our food but that can be reinforced by adding supplements until each person takes in optimum amounts of nutrients. Each patient benefits by getting what their biochemical systems need for them to be well.

The advantage of using natural products is that they are safe. There have been no deaths in the past twenty-five years from vitamins. Each year in the United States alone there are over 100,000 deaths following the use of medical drugs in hospitals. It follows that prescribed drugs have to be used very carefully since the therapeutic index is so narrow. The TI (therapeutic index) is the ratio of the toxic dose compared to the effective dose. Thus for niacin to lower cholesterol levels, the effective dose is usually 1 gram after each of three meals (i.e., three grams daily). The toxic dose is about 300 grams. For niacin, the TI ratio is $300/3 = 100$. There is no known toxic dose of vitamin C and therefore it is so safe that the therapeutic index for vitamin C is undetermined.

In contrast, drugs have to be prescribed very carefully by physicians who must pay strict attention to side effects and toxic reactions; meanwhile, vitamins are safe. A physician may need to spend several years mastering the intricacies of drug therapy, whereas any intelligent person can master the intricacies of vitamin therapy in a much shorter time. Society has recognized this by insisting that drugs must be prescribed whereas vitamins are available over the counter.

To me, it makes sense to depend more on nutrient supplements because they can help to restore defective chemical reactions in the body. Thus in pellagra there is a deficiency of NAD, the coenzyme made from niacin. Giving niacin to a person who is ill with pellagra allows that person's body to synthesize enough NAD so that the symptoms of their disease vanish. On the other hand, drugs interfere with natural reactions. The most effective drugs are those that most closely resemble natural molecules and can be metabolized and excreted. Very dangerous drugs kill because they interfere with reactions in the body. They act as poisons. The ideal killing drug cannot be metabolized and therefore builds up in the body. The ideal therapeutic compound does not build up, but enhances the natural reactions of the body and any excess is excreted. Drugs fall somewhere in between. The closer they are to natural molecules, the more successful drugs can be as therapeutic agents.

Conditions Treatable by Orthomolecular Medicine

Even after working in this field since the 1950s, I do not know all the conditions that will respond favourably. There has still not been enough research in this area. We started with schizophrenia and we had very good results. Almost 80 percent of the early pioneers of orthomolecular healthcare were psychiatrists. The members of the Committee on Therapy soon found that the principles that worked well with schizophrenia also worked well with other disorders such as depression and anxiety; for children with behavioral and learning disorders; and for reversing some of the ravages of aging. However, each condition benefits most from a specific and tailored regimen.

When we saw Ken recover so quickly from catatonic schizophrenia, we did not think in terms of depression. In the first few years that we used vitamins, we excluded every non-schizophrenic patient. Diagnosis was very important and we wanted to work only with schizophrenic patients. Later on we found that kryptopyrole, which we found in the urine of most schizophrenic patients, was also present in other patients and they also responded well to orthomolecular treatment. We found some people who were very depressed and they had this compound in their urine, but they were not schizophrenic. They also got well on the same vitamin therapy.

We know now that the vast majority of mental patients can be treated, but there are certain indications which determine the regimen of natural supplements which should be used in each case. I am convinced that every psychiatric patient should be treated with nutrition and nutrient supplements along with the standard drugs (but preferably without drugs whenever this is possible). No matter what the disease is, the body can cope better if it is as healthy as possible. We started with Ken, a catatonic schizophrenic. His response encouraged us to persevere; we treated thousands of mental patients under careful medical supervision and now we come to the case of Mr. Sealey who is not schizophrenic but suffered severe depression until he placed himself on the orthomolecular program. He also recovered.

The Orthomolecular Program for Restorative Mental Healthcare

NUTRITION – Individual nutrients singly or in combination cannot be used to replace food. The first principle is to examine the food – the patient's diet. The relation between food and health is complex. This has been written about in dozens of books including a book that I wrote with Morton Walker, DPM, called *Orthomolecular Nutrition* (Keats Publishing, New Canaan, Connecticut, 1978) and another book of mine called *Hoffer's Laws of Natural Nutrition* (Quarry Press, Kingston, ON, 1996).

The balance of optimal nutrition that was established during evolution between animals and their environment was so strong that most animals in the wild remained healthy without needing nutritional consultants to advise them. Animals remain healthy because they eat the foods their species has consumed for thousands of years. The best zoos follow the same principle.

Humans have corrupted this relationship by altering food and creating artifacts that appear to be foods but are not very healthy. We have done this to the degree that the natural safeguards present in animals against eating foods which will make them sick are no longer operative. For example, in nature, foods which are bitter will not be eaten because animals do not like bitter-tasting foods. Bitter-tasting foods tend to be poisonous. However, poisons can be embedded in food artifacts which are every bit as dangerous, especially over the long haul, as preparations that have all the appearance and taste of healthy food.

I find two simple rules provide a useful guide for a healthy diet. Most patients understand and they can work with these rules. The first is that all junk food must be removed from the diet. I define junk food as all food preparations containing added free sugars such as sucrose, glucose and lactose. If these are eliminated, about 90 percent of the common additives in our commercial foods will also be eliminated, and this is advantageous. The second rule is to avoid all foods to which you are allergic, even foods which are supposedly healthy for a “normal” person. Food allergies and sensitivities have to be determined by the patient and physician working together. Keeping in mind that the principle of biochemical individuality often applies, if a person is allergic to a common food such as wheat and continues to eat wheat, nutrients will not overcome the symptoms generated by that food allergy.

THE SUPPLEMENTS – These are the vitamins, minerals, essential fatty acids and other natural compounds. They are used in optimum quantities. The problem here is that very few physicians understand what this means. Many doctors still follow the food guides provided by the government’s RDAs. The RDAs were developed to guide governments about the probable needs of a large majority of the community.

The RDAs are only to be used for the healthy part of the population. Therefore, they do not apply to pregnant women, children, and anyone who is ill (i.e., about half the human population). We need recommended daily allowances for each different disease. So far the concept of taking optimal doses of supplements is still too new and frightening to the medical profession, even though they know that when using drugs, one must use the optimum dose to get the expected results and avoid toxic reactions.

The term *megavitamin* was created by Irwin Stone when he discussed vitamin C. It is not really a good word because it just means large dose. It has not been defined more precisely. Some patients have looked for “megavitamins” as if there were vitamins called *megavitamins*. The term refers to the size of the dose. This varies with each nutrient. The best dose of a nutrient depends on the state of each person’s health and that individual’s biochemical needs.

I suspect that eventually every nutrient will find a role for some patients in optimum or orthomolecular doses. The first ones used were vitamins E, C, B-3, B-6 and more recently other vitamins such as folic acid. Folic acid was recently found to be helpful for the treatment of many cases of depression although as Mr. Sealey learned, this is not necessarily a helpful supplement in all cases of depression. Between 1950 and 1970, major interest evolved around the vitamins, over the next ten years minerals were added, and since then the essential fatty acids have been recognized as having great importance.

Resistance to the use of vitamins in orthomolecular doses was very great but began to moderate after the term *antioxidant* came into use. Some of the same doctors who were opposed to using megavitamins later changed their minds and began to use antioxidants such as vitamin E and vitamin C. The discovery that niacin lowered cholesterol levels was published in 1955 marking the introduction of the new paradigm – the vitamins-as-treatment paradigm.

A vitamin dependency is said to exist when a person cannot get well unless given mega doses of one nutrient. This was found to be the case with Canadian soldiers kept in Japanese prisoner of war camps for 44 months. I treated some camp survivors who were very ill but recovered when they were given large doses of niacin.

A few diseases may be expressions of a double dependency (i.e., they need two or more nutrients in large doses). An example is Huntington’s Disease which requires large doses of vitamin E and niacin. I am positive that many more will be found when a proper search is undertaken. If a fraction of the money now being spent studying new drugs was applied toward orthomolecular research, an enormous amount of useful information could be gained in a few years. Recently, I received confirmation that trigeminal neuralgia will respond to the combination of vitamin B-12 injections, vitamin C and l-lysine. Shingles also appears to be a triple dependency on the same three nutrients. The number of permutations and combinations is immense.

XENOBIOTICS – Drugs. These are molecules foreign to the body, but may have structural similarity to natural products or they would be too toxic to be used. Orthomolecular doctors also prescribe drugs, on the principle

that one should recommend the best of modern medicine for every condition. A doctor should not be a bigot, either for or against any set of medical compounds. Orthomolecular physicians use nutrition and supplements as the main program and drugs as add-ons for certain indications, with the aim of getting patients off psychiatric drugs as soon as possible. Tranquilizer drugs can produce a number of negative effects in many patients which I have called the tranquilizer psychosis.

Results Gained by Orthomolecular Treatment

Evidence-based medicine has become the fashion at least in the medical journals and perhaps in the colleges of medicine. I find this ironic since physicians have used evidence-based medicine for thousands of years. The evidence was sometimes faulty and often biased, but at the times these practices were used, they were the best available. Modern evidence-based medicine is not what you might think. It is evidence that can be gained only from the double blind controlled randomized prospective therapeutic trial. My colleagues and I were the first psychiatrists to conduct this type of experiment; I was among the first to examine the method carefully and conclude that while useful, it was not the gold standard, but only one of several ways to research. For many types of disease, this type of experiment is totally unusable. Devotees of this approach will not take Mr. Sealey's account of his illness and his recovery seriously, because they are blinded by the clothes fashioned by the double blind method, like the naked Emperor's clothes.

I ask readers to throw away their blindfolds and to read this account carefully and seriously, because it is one account of a serious illness which might have left the patient forever incapacitated and a charge on his family and community. His anecdote represents only one of thousands of similar cases which have recovered given orthomolecular treatment. The evidence has been published in many clinical accounts, in many standard and complementary journals, and in many books. The evidence is there. It needs only to be read and studied.

So far, out of over fifty physicians who have spent a day or more in my office to observe my practice and talk to my patients, none have resumed their original way of practice. They all became orthomolecular physicians.

Medical resistance remains high. Recently, I saw a chronic schizophrenic patient for the third time in 6 months. He was referred by his psychiatrist. After orthomolecular treatment, he was almost normal. The only residual symptom was that he still heard voices, but they were much quieter. He was looking forward to finding employment. For the previous three

years, he could not work. He stopped seeing the psychiatrist who referred him to me because the psychiatrist would not agree he was better. They fought over his progress. The referring psychiatrist was so blinded by his belief that only drugs could help the patient that he could not see how the patient was making positive progress using orthomolecular methods.

Dr. B. Rimland, founder of the Autism Research Institute, recently reviewed the efficacy of drugs compared to nutrients. He accumulated data from 18,500 parents of autistic children who had been treated. He compared the number of children who were better and the number who were made worse. He found the following ratios of “better over worse.” This might be called the EI (efficacy index). The most effective substances have high EI ratios and the least effective have low EI ratios. Here are comparative EI ratios for commonly used treatments for autistic disorders:

Lower Efficacy	
Antipsychotics	Range from 0.5 to 4.1
SSRI antidepressants, lithium	Range from 1.2 to 3.0

Higher Efficacy	
Vitamin B-3	8.6
Vitamin B-6 and magnesium	10.9
Vitamin C	15.3
Zinc	14.8

The higher EIs for nutrients indicate that children with autistic disorders can benefit more if they take appropriate doses of vitamin B-3, vitamin B-6, magnesium, vitamin C and zinc, than if they take commonly used psychiatric medications.

Over the past 45 years, I have seen thousands of mental patients recover using orthomolecular medicine even though they previously failed to recover using orthodox clinical treatments. It is important that we no longer deprive our psychiatric patients of their chance to get well. To reach my definition of recovery, they must be free of signs and symptoms, they must get on well with their families and the community and they must be able to work enough to provide for their needs and pay income tax.

It is interesting that after suffering for nearly thirty years (ten with undiagnosed and untreated symptoms of depression, and then twenty years with an apparently misdiagnosed and undertreated bipolar II mood disorder), Robert Sealey restored his mental health using orthomolecular methods.

He read many medical reference books and fanned the spark of his desire to get well until it turned into a passion. He finally found restorative care for his mood disorder. Now he is using the story of his experiences to help other people.

Readers will sense his frustration and disappointment when his mental health professionals did not follow their professional guidelines, did not offer competent care and did not help him get well. Even when he took the prescription medications that his doctors recommended, he did not restore normal brain function, but found his symptoms masked as he struggled with negative effects of antidepressants, mood stabilizing and benzodiazepine medications. Mr. Sealey learned that he could trust the logic of the practice guidelines of psychiatry. He kept searching for an accurate diagnosis. He used the guideline principles to get a proper diagnosis and he read reference books until he found and applied the restorative practices of orthomolecular medicine. He restored his mental health without negative effects.

Today Robert Sealey can live well. He works as a self-employed professional in North York, Ontario. He consults with healthy clients and also with people who have episodes of depression and other brain disorders. He writes articles and guides for laymen and health professionals. He shares his experiences living with a bipolar II mood disorder and using restorative mental healthcare. *Finding Care For Depression* is written for patients and caregivers. Mr. Sealey's success using orthomolecular methods for effective mental healthcare can inspire patients, consumers, survivors and caregivers to learn about, ask for and benefit from restorative mental healthcare.

I encourage you to consider Mr. Sealey's recovery story and refer to his helpful selection of tools and tales, tips and traps, reviews and references for laymen and caregivers. People who live with depression and other mental illnesses can use this book if they want to find care for depression, mental episodes and brain disorders.

December 20, 2000 **Abram Hoffer, MD, PhD, FRCP(C)**