



# **Psycho-Nutrition**

## Introduction to:

### Part 1

#### **Unit Purpose:**

By successfully completing this unit, the participant should be able to discuss the possible causes of nutritional deficiencies and toxicity and identify the possible causes of B group vitamin and amino acid deficiencies and the application of nutrition to foster personal wellbeing.

**Section A: The relationship between nutrition and the mind;**

**Section B: Psychological consequences of deficiencies in major nutrients;**

**Section C: Nutritional factors of common disorders.**

### **Introduction: Psycho ...what?**

The human body is a complex biochemical unit. The quality of the fuel ingested by a human body relevant to its needs will determine how well that body functions physically and mentally.

According to Werbach (Werbach, 1991) “Nutrients work to correct a biochemical imbalance usually more slowly than drugs, although some vitamins such as inositol have a drug like action. Drugs can have unpleasant side effects, where as nutrients should be used as the first choice: however, this does not obviate the use of drugs when needed.”

Diet is important to virtually every facet of your life. Good nutrition is more important than just avoiding bad health and disease. It is one of the basic essentials to attain the more abundant life. Diet affects your physical appearance, your energy levels, your intellectual and creative abilities, your mental health and general feelings of well being, even your ability to enjoy love and sexuality.

Nutrients are needed to balance the biochemical mix of the brain. Deficiencies develop mainly through stress, diet and hereditary disposition. Since the 1920's it has been observed that nutrient deficiencies give rise to particular mental insufficiencies. Those who worked specifically with mental health became divided over the issue. Drugs have traditionally been used. However a holistic approach focused on the powers of the body to correct imbalances is not traditionally taught.

### **1.1 Orthomolecular Medicine**

Those who pioneered this area of psycho-nutrition were known as orthomolecular medical practitioners. This name was given by Linus Pauling (Nobel Prize Winner). He described orthomolecular medicine as the provision of proper quantities of nutrients for the individual. More specifically as:

“The preservation of good health and the prevention and treatment of disease by varying the concentrations in the human body of the molecules of substances that are normally present, many of them required for life, such as vitamins, essential amino acids, essential fatty acids and minerals.”

Further to this Pauling States: “a psychiatrist who refuses to try the methods of Orthomolecular Psychiatry (nutrition as related to mental health) in addition to his usual therapy in the treatment of his patients is failing in his duty as a physician.”

Enormous effort and studies have gone into researching the effects of nutrients or the lack thereof on the mind. A two year experiment with more than one thousand schizophrenics treated with megavitamin therapy found 60% treated either improved or had total relief from symptoms. The Canadian Schizophrenia Foundation found 85% recovery rate using megavitamin therapy. After further development the Brain Bio-centre (Princeton, New Jersey) using a biochemical approach found 90% recovery. This approach is found to be more effective, of shorter duration and cheaper than drug therapy.

## **2. Nutrients and their effects on the mind**

“But I have a good diet!” This is a statement that you will hear again and again throughout your practice and in fact it is a statement that many professional therapists still repeat. The client feels that their diet is adequate, but have they ever thought about it? Do they actually know what a good diet is for them?

### **2.1 Malnutrition.**

Malnutrition can be divided into two types:

- **Primary.** Faulty or inadequate intake of nutrients caused by faulty food selection, lack of money, contaminated foods, insufficient soil nutrients or food shortages; and
- **Secondary.** Factors interfering with ingestion, absorption or utilisation of essential nutrients or stress factors that increase their requirement, destruction and excretion.

Although these forms of malnutrition may co-exist, separate factors will affect each individual. Psychological factors are recognised in vitamin deficiency. It may occur that these factors are evident and complicate before avitaminosis is detected.

The Recommended Daily Allowance (RDA) shows the amount of a nutrient required by the average individual in good health. The RDA is generally based on the amount needed to maintain the body pool of the particular nutrient, but the body's demands for nutrients may skyrocket during illness, stress, or recovery from surgery or injury. The RDA gives us the recommended amount of a nutrient to be absorbed, and many factors can alter the body's ability to utilise nutrients in the diet - usually *reducing* the amount we can absorb. There is a large difference between optimum health and physical disease. So will the RDA provide optimal health for *this person* given *their* condition and environment?

Some food sources are seen to have more effect on mental health than others. In relation to the mind, sugar is a major player. Dr. John Yudkin, sugar researcher, states that; "if only a fraction of what is already known about the effects of sugar were to be revealed in relation to any other material used as a food additive, that material would be promptly banned" (in Pfeiffer, 1985).

Hypoglycaemia, which will be discussed later in this module, is a malfunction of sugar metabolism, common in our community as is hyperactivity in children. Sugar and food allergy play a vital role in these disorders that often go untreated.

## 2.2 The biochemical causes of schizophrenia

Two primary leaders in the field of psycho-nutrition, Drs H. Osmond and A. Hoffer of the University of Saskatchewan, researched a biochemical hypothesis concerning schizophrenia. The delirium in pellagra (B<sub>3</sub> deficiency) was seen to be similar to that in psychotics and schizophrenics. They noted that since niacin was added to white processed flour in the USA, pellagra and its consequent psychosis had virtually disappeared.

They used megavitamin therapy. Niacin (B<sub>3</sub>) and Vitamin C were given in 3gram doses each, daily. Subsequently the publication of two double blind studies, thirty papers and several books and pamphlets prior to 1966 brought only indifference and hostility from the medical profession. In the mid 1960s there was an upswing of interest, however even today most medical societies, who are by nature conservative and wary of new ideas, do not acknowledge the use of megavitamin therapy.

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## Section B: Psychological consequences of deficiencies in major nutrients.

### 3. Major nutrients and deficiency symptoms

Two of the major groups of vitamins used in orthomolecular therapy are vitamin B<sub>3</sub>/Niacin and vitamin C.

#### 3.1 Vitamin B<sub>3</sub> (niacin/niacin amide)

As a co-enzyme, niacin (nicotinic acid) assists in the breakdown and utilisation of fats, amino acids and carbohydrates. In this role niacin helps in the oxidation of sugars and is essential to proper brain metabolism. In this way it also helps regulate the blood sugar level in the hypoglycaemic client. Niacin in conjunction with other vitamins raises blood histamine levels which have been shown to relieve such symptoms as paranoia, hallucinations and other disperceptions. Schizophrenics with high histamine and/or Kryptopyrrole (or the Mauve factor which is discussed in Module 202) levels are not helped by B<sub>3</sub>.

Niacin amide, (another form of B<sub>3</sub>) differs in that it has a substituted amide group whereas niacin has an hydroxyl group. The skin redness and 'flushing' which can be caused by niacin can be avoided by using niacin amide in equal proportion to B<sub>3</sub>. Approximately 20% of population flush strongly from niacin, especially if experiencing high levels of anxiety and/or suffer from allergies of some kind.

**Warning:** Niacin amide may cause psychiatric depression in some adults.

The first notable signs of B<sub>3</sub> deficiency are entirely psychological. Victims may feel fearful, apprehensive, and or suspicious with an angry, depressed outlook. These people fold up under stress.

Niacin amide in conjunction with recommending a high protein diet is usually suggested by nutritional experts is they have a psycho-nutritional background - unless contraindicated and B<sub>6</sub>-zinc has been suggested. Niacin amide appears to make the other vitamins present in the diet more effective.

**Note:** A “strawberry tipped” tongue is a sign of B<sub>3</sub> deficiency. A psycho-nutritionalist may recommend their client to start with 50 mg x 3 daily and increase to maximum dosage - usually up to 3g (Pfeiffer, 1975).

### 3.2 Vitamin C

Linus Pauling brought the world’s attention to the use of vitamin C in reducing the incidence of the common cold. Vitamin C is known to be essential for many biochemical functions and has been found to have an anti-anxiety (as shown by the quantitative EEG) or sedative effect. Vitamin C also mobilises heavy metals such as copper, lead and mercury and allows their excretion by the kidneys. Several clinicians have observed that ascorbic acid in ‘large doses’ has a therapeutic effect in some schizophrenics. In some schizophrenics, increase of urinary output of vitamin C does not occur even after administration of enormous doses. This may indicate that the vitamin has been retained by the tissues and utilised for specific needs. This suggests a biochemical abnormality in the utilisation of vitamin C in some clients.

Mental symptoms of vitamin C deficiency are fatigue, listlessness, confusion, depression. This person frowns with a ‘pained’ expression. Confusion states in the elderly, often mistaken for senility, may in fact be due to vitamin C deficiency. When this is the case 1g daily for 3 weeks may clear it.

As mentioned previously, vitamin C has an anti-anxiety effect. Doses of 1 to 2g work as well as a sedative for the anxious or the insomniac. In a controlled study of 351 students, those with higher blood vitamin C levels scored an average of 5 points higher than those with lower vitamin C levels. When those patients with the lower vitamin C levels, were given a supplement of orange juice for six months, their IQ increased by 3.54 points, (Kabula & Katz, 1960). Keep this in mind at exam time! When attention and enthusiasm lag during study, tap a gram of vitamin C into some juice and see how it helps!

There is no set amount of vitamin C for everyone. When the body system is stressed it uses more vitamin C. Linus Pauling (who is in his nineties) takes more than 15g/day. Our modern diet supplies 100-200 mg daily while our ancestors would have received in excess of 100 mg daily. They were not, however; exposed to smog, did not drink water through copper pipes (copper inactivates vitamin C) ingest chemicals and preservatives through their food, smoke cigarettes, nor were they exposed to x-rays (Kabula & Katz, 1960).

### 4. Hypoglycaemia

Hypoglycaemia means low blood glucose (sugar). The results of this abnormal glucose metabolism are low cellular “fuel levels”. The body and the mind do not have the glucose necessary to carry on their work. The preferred food or energy source of the brain is glucose. The lowering of mood that comes with low blood sugar is chronic in the hypoglycaemic. Hypoglycaemia is one of the most important causes of exhaustion, depression and chronic nervous tension and prevents many from achieving happy productive lives.

Physical and emotional disturbances in hypoglycaemia vary. Mental symptoms include fatigue, nervousness, irritability, anxiety phobias, disperceptions, headaches and insomnia. No two cases are exactly alike.

Hypoglycaemia has been called the ‘great mimic’ as its symptoms mimic many other disorders. It affects more women than men and is more likely in the person with family history of obesity, diabetes, mental illness or alcoholism. This client often feels awful in the morning, fades at 4 in the afternoon and needs coffee and biscuits or simple carbohydrate food. They crave sugar and simple carbohydrates.

#### **4.1 Sugar Regulation**

When food is eaten and blood glucose rises the hormone insulin is released into the system from the pancreas. Insulin removes the blood sugar for storage in the form of glycogen in the liver. The substances glucagon, growth hormones, glucocorticoids and adrenalin are antagonists and raise the blood sugar. We know, further, that the hormone glucagon works with these other factors to reconvert glycogen into blood sugar for energy. Thus a balance of the proper blood glucose levels can be maintained. Hypoglycaemia can be the result of several malfunctions in this chain, e.g. pancreatic malfunction, or combination of excess insulin and deficient glucagon.

No one is sure of the cause of hypoglycaemia. It is, however, frequently triggered by diet or stress. Diets today are commonly high in refined simple carbohydrate and also large amounts of coffee make up the daily diet. Our origins as hunter-gatherers meant the development of a digestive system evolved to store energy until the next meal (which may have been some time until another animal was caught). This largely protein diet has been changed radically as we now have grain crops and have made a shift to increased carbohydrates.

Refined carbohydrates give calories but not the nutrients and fibre necessary for a healthy mind and body. The increase of sugar and stimulants stresses the whole biochemical balance of the body. Add to these chemicals in foods, car exhaust fumes and the general stresses of life and it's easy to see why hypoglycaemia is so common.

#### **4.2 Diagnosis and Treatment**

Many hypoglycaemic patients have been told that their symptoms are ‘just nerves’ or ‘all in your head’. The symptoms that have been described may be common among your clients. A thorough history and knowledge of dietary habits will give you a solid background. Remember that this person's perception may be distorted so testing will be necessary. As discussed in Module 201 and 202 the HOD test is used to gauge the levels of depression and perceptual dysfunction being experienced. You should also use the Hypoglycaemia Questionnaire.

The normal individual primarily uses carbohydrates for energy. However, the hypoglycaemic cannot, because of a malfunctioning mechanism. So, the hypoglycaemic must make use of more protein and fat to maintain high blood sugar. Some experts indicate that for the hypoglycaemic, a high protein diet is mandatory others suggest alternatives such as low protein but high complex carbohydrates.

Frequent high protein snacks are suggested between complex carbohydrate meals. Liberal amounts of protein foods will prevent hypoglycaemic symptoms for a period of 2 to 6 hours depending on the type of glucose curve the client has.

Sugar, refined carbohydrates, alcohol, caffeine, tobacco and other stimulants must be avoided! Natural carbohydrates and sugars (in fruits and vegetables) are limited to small amounts during the day. A regular schedule of daily exercise is an essential part of the treatment.

Remember a system that is struggling when changed to this diet will experience enormous change and possible withdrawal symptoms. An un-well system that gives up sugar, caffeine, smoking and changes diet may go into shock. Have compassion, work slowly. This problem takes time to develop and will take time to correct.

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## Section C: Nutritional factors of common disorders

### 5. Common disorders and their nutritional counterparts

There are many common disorders that affect the mind with nutritional counterparts. Depression, eating disorders, anxiety, PMS and insomnia are some of the major ones. Let's look at them individually.

#### 5.1 Depression - Nutritional Causes:

- Food sensitivities.
- Deficiencies of biotin, folic acid, pyridoxine, riboflavin, thiamine, vitamin B<sub>12</sub> or vitamin C.
- Deficiencies of calcium, iron, magnesium or potassium.
- Frequent consumption of caffeine or sucrose.
- Excesses of magnesium, vanadium or copper - give zinc to balance copper-zinc ratio.

#### 5.2 Eating disorders: Anorexia nervosa – Bulimia:

- Warning: Anorexia nervosa, if unsuccessfully treated, is a terminal disease.
- Anorexia Nervosa: Findings
- It has been postulated that sub-clinical pellagra may be a cause of anorexia nervosa and a few clients have been reported to improve following niacin supplementation.
- Clients may be deficient in zinc. Since zinc deficiency is associated with reduction in the senses of taste and smell, it may be a cause of anorexia nervosa. In placebo-controlled studies, zinc supplementation improved appetite, taste sensitivity and mental state (Werbach, 1991).
- Clients may be deficient in essential fatty acids which are important in zinc absorption (white spots on nails). Also, zinc deficiency may impair essential fatty acid metabolism, the results of human trials have been reported.

#### Bulimia:

- Recommendations include a nutrient dense; sugar free diet may reduce binge eating.
- Supplementation with the amino acid called L-tryptophan may assist along with pyridoxine was effective in improving mood, eating behaviour and feelings about eating in a double blind crossover study.

#### 5.3 Anxiety:

The glucose /pyruvate / lactate metabolic chain appears to be significant in anxiety.

- “Clinical anxiety may be associated with an elevated blood lactate level and an increased lactate to pyruvate ratio” (Buist, 1985). The lactate to pyruvate ratio is increased by alcohol, caffeine and sugar, and decreased by deficiencies of niacin, thiamine or magnesium. While more studies are needed, it appears that normalising an elevated blood lactate to pyruvate ratio will sometimes relieve anxiety.
- Pyridoxine deficiency may cause anxiety. Sufferers are painfully shy sick recluses who avoid other people, but are mentally alert.
- Both hyper and hypocalcaemia may present with anxiety which remits when the underlying problem is corrected.
- Results of a very small, uncontrolled study suggest that omega-3 fatty acid deficiency may cause agoraphobia as part of the deficiency syndrome (Werbach, 1991).
- While the literature suggesting that food sensitivities may cause anxiety is largely anecdotal, one double blind study found greater cognitive - emotional symptoms in symptomatic subjects

following sublingual exposures to common foods than following placebo procedure (Werbach, 1991).

#### 5.4 Premenstrual syndrome (PMS):

Premenstrual syndrome has been divided into four subgroups:

- **PMS-A:** (Anxiety): anxiety, irritability, insomnia, and depression. **PMS-A** is characterised by elevated blood oestrogens and low progesterone. Clients consume excessive dairy products and refined sugar. Caffeine should be reduced and total fats limited to 30% of calories. Increase fibre, twice as much vegetable protein as animal protein should be consumed. Pyridoxine 200-800mg daily reduces oestrogen and increases progesterone under double blind conditions (Werbach, 1991).
- **PMS-C:** (Craving): craving for sweets, increased appetite, sugar ingestion, headache, palpitations, fainting and fatigue. **PMS-C's** main cause is a diet high in refined carbohydrates. Magnesium is low and prostaglandin E<sub>1</sub> may be deficient. Supplementation with magnesium and chromium may help. Cis -linoleic acid (safflower oil is good source) should be increased to 5-6% of total calories while animal fat consumption should be limited. Increase complex unrefined carbohydrates to 40% of total calories. Eliminate refined sugar.
- **PMS-D:** (Depression): depression, forgetfulness, confusion, lethargy. **PMS-D.** Progesterone and sometimes adrenal androgens and or lead intoxication are high in these clients. Pyridoxine and Magnesium may benefit. L-tryptophan 5-1g for insomnia and tyrosine where it is deficient.
- **PMS-H:** (Hyperhydration): weight can increase 1-4 kg., breast congestion and tenderness occurs, there is oedema of face and extremities. **PMS-H** is associated with symptoms of water and salt retention and possibly by elevated serum aldosterone. Methylxanthines (coffee) should be avoided and sodium limited to 3 g/day. Pyridoxine suppresses aldosterone resulting in diuresis while magnesium increases the threshold response to stress thus preventing ACTH - mediated aldosterone secretion. Vitamin E reduces breast symptoms.

#### 5.5 Insomnia:

For clients with insomnia, consider:

- A high caffeine intake may increase sleep disturbances.
- Alcohol may impair quality of sleep.
- High magnesium intake may be associated with sleep patterns
- L-tryptophan may reduce sleep latency.
- Cow's milk allergy may cause sleeplessness in infants.
- Niacin amide copper iron magnesium may improve sleep.
- Rule out food sensitivities.
- Consider vitamin supplements - vitamin C and inositol are referred to as the 'sleep vitamins'.

#### 6. Summary:

The nutrient revolution is part of the whole revolution to “clean up” the internal environment. Humanity never lived in a “garden of Eden”, where only pure foods existed, since many natural foods contain toxic substances. We did, however, learn how to deal with these over time. The new barrage of debilitating and toxic substances in our food and over processing with its attendant nutrient losses, are causing preventable illness and mental distress in our society.

Nutritional research offers the remediation of food-induced illness. The progressive identification of diet-related conditions, and their remedies, will allow us to significantly reduce the incidence of physical and mental illness, leaving us with a more healthy and sane society, and freeing resources to focus more effectively on the more refractory genetically-caused disorders.

“Megavitamin” therapy uses vitamins at doses much higher than the Recommended Daily Allowances. The metabolic pathways of such doses have not been clarified: In some cases (vitamin C, for instance), doses of a few grams per day may be taken up by conventional metabolic activity. In other cases, the vitamins may be acting more like drugs - altering the metabolism rather than performing the normal vitamin role of enzymatic action.

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### **8. Exercises:**

To assist in your clarification you might like to answer the following questions and check your information with the answers presented below.

1. What is orthomolecular medicine?
2. What is the RDA for a nutrient? For whom is it intended?
3. Can megavitamin therapy cure mental distress?
4. Name the two types of malnutrition, and give an example of how a person might suffer from each type.
5. Describe the role of niacin in the cell's metabolism. Name a common sign of niacin deficiency.
6. Name two conditions that respond to megavitamin doses of vitamin C. List the mental symptoms of vitamin C deficiency.
7. Describe hypoglycaemia and briefly describe the dietary strategies for hypoglycaemia.

### **9. Answers to exercises:**

1. The preservation of good health by altering the concentrations of substances that are normally present - vitamins, minerals, and essential amino acids and fatty acids.
2. RDA is the amount of a nutrient needed daily to replace normal losses. The RDA is designed for the average person in good health.
3. Specific conditions, yes.
4. Primary malnutrition - suffered by people with inadequate or faulty nutrient intake. Secondary malnutrition - suffered by people whose ingestion, absorption or utilisation of nutrients is affected.
5. Niacin is a co-enzyme involved in the breakdown and utilisation of fats, amino acids and carbohydrates. Deficiency signs are psychological, and a strawberry-tipped tongue is a definite physical sign.
6. Vitamin C reduces the incidence of the common cold, and has an anti-anxiety effect. Vitamin C deficiencies cause fatigue, listlessness, confusion and depression.
7. Hypoglycaemia is low blood glucose. The diet uses frequent high protein snacks, and avoidance of refined carbohydrates.