



CONTINUING EDUCATION (CE) COURSE MATERIAL
Course No. CE1304P3 – Medical Treatment: Nutrition and Recovery

COURSE OBJECTIVE

An examination of nutrition and its relationship to recovery from addictions.

COURSE MATERIAL

The effects on the brain and its neurotransmitters of alcoholic or other addicted persons have been documented.¹ There are many vitamins, minerals, amino acids, herbs, enzymes, and antioxidants that help us with well-being. It is suggested that with a proper diet a person would not need supplements.

In a perfect world, foods would be organic, not processed. There would be no pollutants. People would exercise, sleep well and have a spiritual balance in their lives. However, in an effort to have fatter cows and greener greens, rid our plants of pests, have chickens produce larger eggs and to have “white” bread, science has managed to strip the foods of the earth of their natural vitamins, antioxidants and minerals. Refineries have been built with little regard to air and water pollution. The earth has over populated without teaching its children the peace and sacredness of nature.

Further, illnesses are typically treated with “a pill” or people learned to “self medicate” for instant results. Precious bodies, minds and spirits have become overweight, underused and spiritually bankrupt. Bodies are put through rigorous weight loss programs or massive assaults of steroids in an effort to become a perfect “10”. Brains are not stimulated with puzzles and math problems; rather, a computer is turned on. Of all the abuses, God was banned from our schools and He was not replaced with a walk in nature, sitting quietly by a riverbank or looking at the stars. Lives have gotten out of balance and, for some, substances were used in an effort to restore balance.²

The purpose of this course is to suggest a way to rebalance the lives of some addicts. Some addicts have severe mental illnesses and simply balancing their lives would take many years of therapy as well. However, those with a less severe dual diagnoses and those addicts without a dual diagnoses could be able to balance their lives without the need for substances.³ Those with Post Traumatic Stress Disorder (PTSD), Bi-Polar Disorder or Depression can also benefit from a healthy balance in their lives⁴.

Much of the information in this course will be centered around alcohol abuse since much of the data available is on alcoholism. However, there is also reliable data for addiction to other chemicals and Obsessive Compulsive Disorders (OCD) like gambling and eating disorders⁵. Caroline Myss' book “Why People Don't Heal and How They Can” points out some of these imbalances.

¹ Frances and Miller: 101, 109-110. 1998

² Pitchford, Paul, pg. 389-394, 1993

³ The use of the word “substances” in this course will be used interchangeably with the words chemical substance or other addiction such as gambling, overeating and other compulsive disorders.

⁴ Larson, Joan M., 1997

⁵ Ibid



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First examined will be the function of some body parts, which will be followed by reviewing how vitamins and minerals can keep one physically and mentally healthy.

Body Parts and Functions

The Pancreas is a flat, thin nodular gland that secretes enzymes into the small intestines which digest fats, proteins and carbohydrates and it secretes insulin and glucagons. Insulin and glucagons are hormones that regulate metabolism. Pancreatic insufficiency can cause nutritional malabsorption, anorexia, upper abdominal pains, malaise (bodily weakness), blood sugar imbalance and severe weight loss. Heavy Alcohol use blocks the enzymes needed for absorption. An inflamed pancreas can be acute caused by drinking heavily over a period of at least 10 years. This can lead to chronic illness and then renal failure. Abstaining from alcohol will diminish the inflammation but will not halt the destructive process once it reaches the chronic stage. Malabsorption is the result of the insufficient intestinal nutrients of iron, folic acid and vitamin B12. Other major disorders of the pancreas include inflammation or cancer of the pancreas.

The Liver is the largest and most complex gland in our bodies. It is divided into four lobes and served by two distinct blood supplies. The hepatic arteries send oxygenated blood to the liver and the veins send nutrients from the stomach and intestines. The liver is responsible for hundreds of intricate biochemical processes. Some of the major functions are the production of bile, the secretion of glucose, proteins, vitamins, fats and other compounds used by the body. The processing of hemoglobin for iron and the conversion of poisonous ammonia to urea. Diseases of the liver include fatty liver (90 % of heavy drinkers), alcohol hepatitis (40% of heavy drinkers) and cirrhosis (15-20% of heavy drinkers). Fatty liver (hepatic steatosis) is the most reversible disease (usually within 6 months) with abstinence from toxins. Alcohol hepatitis can be helped with alcohol abstinence and nutritional support.⁶ If alcohol use continues, there is a 50 % chance that this will lead to cirrhosis. Cirrhosis, the most severe of liver diseases, is a chronic degenerative disease in which the lobes are covered with fibrous tissues and infiltrated with fat.

The Cardiovascular System is a network of structures which include the heart and blood vessels that pump blood throughout the body, carrying nutrients and other essential material and removes waste products by conveying them to the kidneys and intestines for excretion. Heart disease is the largest health problem in the United States.⁷ Alcohol and other Drugs (AOD) weaken the heart muscle by increasing calcium into the muscle, decreasing protein synthesis and causing mitochondrial disruption. Nutritionally, coffee, alcohol, tobacco and marijuana interfere with calcium absorption. AOD abuse can cause congestive heart failure (with continued alcohol use there is a 54% mortality rate), hypertension and/or strokes.⁸

The Nervous System is the network of structures that activate, coordinate and control all functions of the body. It is divided into the central nervous system (CNS) which contains the brain and spinal cord and the peripheral nervous system (PNS) which contains the cranial nerves and spinal nerves. Because AOD damages both the CNS and PNS by altering neurotransmitter levels and cell membrane fluidity and functions, several diseases can occur from use. One of the most noted diseases is Wernicke-Korsakoff syndrome, which is a combination of Wernicke Encephalopathy (characterized by double vision, involuntary and rapid

⁶ Balch & Balch, 2000

⁷ Pitchford, 1993

⁸ Miller, 1998



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eye movements, lack of muscular coordination and decreased mental function) and Korsakoff Psychosis (an amnesia characterized by short term memory loss and inability to learn new skills). Another noted disease is Hepatic Encephalopathy which causes the liver to fail and is characterized by inappropriate behavior, agitation, depression, apathy, sleep disturbances, confusion, disorientation, asterixis (hand flapping), tremors, rigidity and hyperreflexia (increased reflex action).

The Endocrine System is a network of ductless glands and other structures that secretes hormones directly into the bloodstream affecting specific targeted organs. The endocrine glands include the thyroid and parathyroid, anterior and posterior pituitary, the pancreas, the suprarenal, the pineal and the gonads. Some of the signs of disease in the endocrine system are testicular atrophy, low testosterone, diminished sperm and loss of libido in men, amenorrhea in women, late luteal phase dysfunction (might cause abortion) and early menopause for women.

The Musculoskeletal System includes all of the muscles, bones, joints and related structures such as tendons and connective tissue that function in movement of the parts and organs of the body. Alcohol and other drugs may cause rhabdomyolysis (painful tender swelling of one or more muscle groups and/or progressive muscle weakness and wasting).

The Immune System is a biochemical complex that protects the body against pathogenic organisms and other foreign bodies. The exterior body (i.e. skin, hair, mouth) and the interior body (i.e. bones, organs) can be affected by a chronic and short term disease (a cold) or a chronic and long term disease (Diabetes). AOD depresses the natural killer cell activity and lymphocyte transformation.

The Brain is a complex structure divided into three interconnecting layers. The deepest layer is a region called the central core and is primarily involved with autonomic processes. It is divided into the medulla, the pons, the reticular formation, the thalamus and the cerebellum. The central core of the brain is responsible for breathing, waking, dreaming, body movements, relaying sensory information, equilibrium and heart beat. The next layer is the limbic system or the "reward/pleasure center". The hippocampus plays a role in long-term memory. If damaged, new information can be learned but long-term memory is lost. The amygdala plays a role in aggression, sexual pleasure, and feeding and drinking. The hypothalamus plays a vital role in daily actions. It involves motivated behaviors, regulating temperature, sexual arousal and signals for nutrients by making us feel hunger. The first two layers are the primitive region of the brain also known as the "old brain" and is responsible for breathing, heart beat, pleasure etc.⁹ The outer layer is the cerebral cortex (the "new brain") separating man from the lowest animal species by regulating the brain's highest cognitive and emotional functions. The left side of the brain is for language, integration of complex movement, memory of words and numbers, anxiety and positive emotions. The right side of the brain is responsible for memory for music, geometric patterns, facial recognition and negative feelings.

The brain is protected by a blood barrier that essentially keeps toxins, viruses and bacteria out of both the brain and the Central Nervous System (CNS). However, psychoactive drugs are fat-soluble and do pass through the barrier. Within the brain and the CNS are neurotransmitters which transmit signals from one neuron to the next jumping a synaptic gap. Certain drugs mimic or block receptor sites. Neurotransmitters are a natural way to feel physical/mental pleasure,

⁹ Inaba, 1997



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control pain, stabilize mood, control motor activity, relax muscles, regulate heartbeat and blood pressure, help with memory and learning and heal or enhance the immune system. If a particular neurotransmitter did not exist, then psychoactive drugs would have no effect on the brain or body. The effects of AOD on the brain are caused by a disruption of these transmitters.

Could a disrupted neurotransmitter be a result of poor nutrition? Is it looking for a replacement through psychoactive drugs or other addictive behaviors? Neurotransmitters are affected by vitamins and minerals. A lack of nutrients either by malabsorption or poor eating habits directly affects brain function. AOD interferes with the oral intake and intestinal uptake of vitamins and minerals essential for hematopoiesis (the normal formation and development of blood cells in the bone marrow).

AOD use also causes skin disorders, internal and external infections, as well as damage to a fetus and has been a contributing factor in some cancers.¹⁰ The above are some of the major body parts and functions affected by AOD. For bodies to function properly, humans need a balance of nutrition.

Vitamins, Minerals, Herbs, Amino Acids, Enzymes, Natural Food Supplements and Anti-Oxidants

As mentioned in the introduction, most vitamins, minerals, antioxidants and amino acids can be obtained in the food that is eaten. Unfortunately, most people do not eat a balanced diet based on the body's needs. People in high stress jobs might need more of one mineral or vitamin than a person with a low stress position. Men may need more of one vitamin and mineral than women and vice versa. Those who perform heavy labor or extensive weight training will need more vitamins and minerals than a "couch potato".

Daily requirements are based on RDI (Reference Daily Intakes) formally referred to as RDA (Recommended Dietary Allowances). Unfortunately, these guidelines (RDI) only give the bare minimum to ward off deficiencies.¹¹ Dosages higher than RDI recommendations may help the body (and mind) work better, keeping in mind that over use or abuse of vitamins may also be harmful: Too much of a vitamin or mineral can cause the same symptoms as a deficiency.

The following pages will explain the benefits of vitamins, minerals, herbs, etc. For the purpose on conciseness, the focus is primarily related to the affects of alcohol and other drugs, either directly (e.g., liver disease) or indirectly (e.g., depression, anxiety).

Vitamins

Vitamin A – Vitamin A prevents night blindness and other eye problems, skin disorders, enhances immunity to help gastrointestinal ulcers, maintains and repairs epithelial tissues (outer layer of the skin), reduces fine lines on the face and helps fade age spots. Vitamin A helps in the formation of bones and teeth, protects against colds, flu and infections of the kidney, lungs and mucus membranes. It is an antioxidant (see antioxidants below) which helps protect against cancer and is necessary for new cell growth. Vitamin A slows the aging process, guards against heart disease and strokes, and lowers cholesterol levels. Protein can not be utilized without Vitamin A. A deficiency can cause dry hair or skin, dryness in the eye, abscesses in ears, insomnia, fatigue, reproductive difficulties, respiratory infections and weight loss. Carotenoids are a class of compounds related to Vitamin A. Carotene is a subclass of

¹⁰ Balch and Balch, 2000

¹¹ Presser, 2000



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carotenoids to which beta-carotene, alpha and gamma carotene and lycopene belong. They are converted to Vitamin A in the liver. Beta-carotene, the most noted one, aids in cancer prevention as an antioxidant neutralizing free radicals (see antioxidants below). Science has identified 563 carotenoids and has shown that taking them in combination is more beneficial than taking one alone. It would be difficult to overdose with Vitamin A; however, taking a supplement of over 100,000 IU (International Units measure potency, not weight or volume) daily for long periods of time can be toxic, mainly to the liver. Beta-carotene is recommended as long as your liver has the ability to convert it to Vitamin A. It is always best to obtain vitamins from their natural source, and Vitamin A can be found in animal livers, fish liver, fish liver oils and green and yellow fruits and vegetables. Animal sources are 6 times stronger than vegetables sources. Research shows a decrease of cancer for heavy smokers by 7 times with the use of vitamin A.¹² It is recommended to consult a physician before taking Vitamin A if one has a liver disease, is pregnant, has diabetes or hypothyroidism or if one is giving Vitamin A to a child.

B Complex – This mixture of vitamins helps maintain the health of the nerves, skin, eyes, hair, liver and mouth, brain function, as well as healthy muscle tone in the gastrointestinal tract. B-complex vitamins act as coenzymes helping enzymes react chemically to other substances and are involved in energy. Since they work well together, a deficiency in one B vitamin indicates a deficiency in another. For specific disorders, 2 or 3 times more of a particular B may be taken.

B1 (Thiamine) – Thiamine enhances circulation and assists in blood formation, carbohydrate metabolism and production of the hydrochloric acid needed for digestion. Thiamine optimizes cognitive activity and brain function, it has a positive effect on energy, growth, normal appetite, and learning capacities. It is needed for muscle tone in the intestines, stomach and heart. Thiamine is an antioxidant that protect the body from the degeneration related to aging, and the use of alcohol, caffeine and tobacco. Alcoholics are among those most often deficient in the B1 Vitamin. Foods high in B1 are brown rice, egg yolk, fish, legumes, liver, peanuts, peas, pork, poultry, wheat germ and whole grains. A few other sources include Brussels sprouts, kelp, most nuts, plums and watercress.

B2 (Riboflavin) – Riboflavin is necessary for red blood cell formation, antibody production, cell respiration and growth. It prevents eye fatigue and cataracts, and aids in the metabolism of carbohydrates, fats and proteins. Combined with Vitamin A, it maintains and improves mucus membranes in the digestive tract, facilitates the use of oxygen by the tissues of the skin, nails and hair, helps absorb iron and Vitamin B6. B2 is needed for the metabolism of tryptophan which is converted into niacin in the body after it is metabolized. B2 is destroyed by light, antibiotics and alcohol. A few of the foods it is found in are cheese, egg yolk, fish, legume, meat, milk, spinach, whole grain and yogurt.

B3 (Niacin, Nicotinic Acid, Niacinamide) – B3 is needed for proper circulation, healthy skin, and healthy functioning of the nervous system. B3 is involved in metabolizing carbohydrates, fats and protein, in the production of hydrochloric acid for the digestive system, normal secretion of bile and stomach fluids. B3 assists in the synthesis of sex hormones, lowers cholesterol, and is helpful for schizophrenia and some other mental illnesses. It is also a memory enhancer. A few sources of Niacin and Niacinamide are beef liver, brewer's yeast, broccoli, carrots, corn flour, dates, milk, and pork. A harmless flush may appear on the body with niacin and sometimes a red rash and a tingling feeling are experienced. Niacinamide does not cause similar effects;

¹² Pitchford, 1993



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however, it does not have the properties of niacin that lower cholesterol. It could be dangerous to take large doses of B3 if a person is suffering from liver disease. B3 can cause a drop in blood pressure and a rise in blood sugar levels.

B5 (Pantothenic Acid) – Pantothenic Acid is known as the “anti-stress vitamin”. It plays a role in the production of adrenal hormones, the formation of antibodies, aids in vitamin utilization, and helps convert fats, carbohydrates and proteins into energy. Every cell in the body needs B5. B5 is concentrated in the organs. One of the main functions is the production of neurotransmitters. B5 is a coenzyme with Vitamin A to create metabolic functions. B5 is best known as a stamina enhancer and as a preventor of anemia. Some foods that provide B5 are beef, brewer’s yeast, eggs, fresh vegetables, kidney, legumes, liver, mushrooms and whole wheat.

B6 (Pyridoxine) – Pyridoxine is involved in more bodily functions than any other single nutrient. It affects both the physical and mental health. B6 will help with the reduction of water retention, production of hydrochloric acid and absorption of fats and proteins. Pyridoxine helps maintain the proper sodium and potassium balance; it promotes red blood cell formation, is needed for normal brain function and is required by the nervous system. B6 aids in the synthesis of the nucleic acids RNA and DNA. It helps prevent arteriosclerosis and plays a role in cancer immunity. Further, it inhibits homocysteine (a by product of normal protein metabolism, formed specifically from the conversion of the amino acid methionine),¹³ which attacks the heart muscle and which allows cholesterol around the heart. A few foods that contain B6 are brewer’s yeast, carrots, chicken, eggs, fish, meat, peas, spinach, sunflower seeds, avocados, bananas, broccoli, brown rice, soybeans and potatoes.

B12 (Cyanocobalamin) – This vitamin is needed to prevent anemia. B12 helps folic acid in regulating the formation of red blood cells and utilizing iron. It is required for digestion, absorption of foods, synthesis of protein and the metabolism of fats and carbohydrates. B12 prevents nerve damage; maintains fertility and promotes normal growth. Cyanocobalamin is linked to the production of acetylcholine which aids learning and memory. B12 is found in clams, eggs, herring, kidney, liver, milk and dairy products, and seafood. Most vegetables do not have any B12; but it can be found in sea vegetables like kombu, kelp, nori and soy products.

Biotin – This vitamin is needed for cell growth, production of fatty acids, metabolism of carbohydrates, fats and protein, and in the utilization of the B-complex vitamins. Biotin also helps promote healthy sweat glands, healthy hair and skin, healthy nerve tissue and bone marrow. A few foods that contain Biotin are brewer’s yeast, cooked egg yolk, meat, milk products, saltwater fish and soybeans.

Choline – Choline is needed for the proper transmission of nerve impulses from the brain to the CNS. Without Choline brain function and memory will be impaired. It regulates the gall bladder, liver function and lecithin formation. Choline minimizes excess fat in the liver by metabolizing fat and cholesterol. Some of the foods that contain Choline are egg yolk, lecithin, legumes, meat, milk, soybeans and whole grains.

Folate – Folate is also known as folacin, folic acid or pteroylglutamic acid. It is often referred to as the “brain food” and is needed for the production and formation of red blood cells. Folate strengthens the immune system by aiding the proper formation and function of white blood cells. It is a coenzyme in DNA and RNA synthesis and is involved in protein metabolism. Folate has

¹³ Presser, 2000



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been used in the prevention and treatment of folic acid anemia. This vitamin regulates homocysteine. Folic acid is helpful with in depression and anxiety. Some of the foods that contain Folate are asparagus, barley, bran, beef, leafy vegetables, salmon, tuna, whole grain, liver, milk and oranges. Alcohol and the cooking of vegetables and fruit destroy Folate. High doses of Folate over extended periods can be detrimental if you have hormonal cancer or a seizure disorder.

Inositol – Inositol is vital for hair growth. It has a calming effect and reduces cholesterol levels. Inositol helps remove fat from the liver and is useful in the treatment of depression, obsessive-compulsive disorder and anxiety disorder without the use of prescription medication. It can be found in brewer's yeast, fruits, lecithin, legumes, meats, milk, unrefined molasses, raisins, vegetables and whole grains. Large amounts of caffeine may cause a shortage of Inositol in the body.

Para-Aminobenzoic Acid (PABA) – PABA helps the assimilation of Pantothenic acid (B5) and is a basic constituent of Folate because it is converted into Folate by intestinal bacteria. This antioxidant protects against sunburn by absorbing ultraviolet-B radiation. PABA assists in the formation of red blood cells and helps maintain a healthy intestinal flora. This vitamin is a protection against second hand smoke, ozone and other air pollutants. It can be found in kidney, liver, molasses, mushrooms, spinach and whole grains.

Vitamin C (Ascorbic Acid) – Ascorbic acid is an antioxidant that is required by 300 or more functions of the body, such as tissue growth and repair, glandular function, and healthy gums. Vitamin C is a helpful aid in the production of anti-stress hormones and interferon (a very important protein for the immune system). Vitamin C is needed for the metabolism of folic acid, tyrosine and phenylalanine. It protects against pollutants, helps prevent cancer and infection plus enhances immunity. Vitamin C can combine with toxic metals and render them harmless and it helps increase the absorption of iron. It reduces the LDL (bad cholesterol) and increases the HDL (good cholesterol), and protects against abnormal blood clotting and bruising. Vitamin C works in conjunction with vitamin E and beta-carotene to scavenge for dangerous free radicals. Bodies can not produce vitamin C so it needs to be obtained from diet and supplements. Vitamin C is not held in the body and washes out in urine. If large doses are needed, it is best taken by intravenous therapy under the advisement of a physician. There are numerous sources of vitamin C, some of which are berries, citrus fruit, green vegetables, tomatoes, alfalfa, fennel seed, oat straw, rose hip, sweet peppers, persimmons and radishes. Alcohol, tobacco and steroids may reduce levels of vitamin C. It is recommended that ascorbic acid be taken in divided doses throughout the day and that it is taken in it's esterified form (esterified means an organic ester made from an inorganic salt, which allows vitamins to be absorbed four times faster moving into the bloodstream more efficiently and staying in tissues longer). Vitamin C (not esterified) and aspirin can cause stomach irritation. Do not take excessive doses if pregnant, as the fetus can become dependent on this supplement and the baby's body will crave mega-doses after birth.

Vitamin D – This is a fat-soluble vitamin that is both a vitamin and a hormone. Vitamin D is required for absorption and utilization of calcium and phosphorus. It is necessary for growth and the development of bones and teeth in children. Vitamin D protects against weak muscles. It influences the regulation of heartbeat. It is a preventative of, as well as being used in the treatment of breast and colon cancers, osteoarthritis, osteoporosis, hypocalcemia (low calcium) and the enhancement of immunity. Vitamin D comes in different forms: D2 (cholecalciferol) is found in foods and synthesizes in the skin with sun exposure, D5 (a synthetic form), and D3,



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the natural and most active form. The vitamin D obtained from foods and supplements is not fully active. It requires conversion in the liver and then the kidneys; therefore, people with an unhealthy liver or kidneys are a high risk for osteoporosis. The best form of vitamin D is gained by sitting in the sun for 15 minutes a day, 3 times a week. This, of course, poses a problem in winter months, so often supplements are necessary. The best supplemental sources of vitamin D can be found in fish liver oil, fatty saltwater fish, dairy products and eggs, cod liver oil, oatmeal, sweet potatoes, vegetable oils, alfalfa, and parsley. Taking over 1,000 I.U. daily may cause a decrease in bone mass. Taking over 65,000 I.U. for over a two year period can cause toxicity. One should not take vitamin D without calcium to help with absorption.

Vitamin E – This vitamin is an antioxidant that is important in the prevention of cancer and cardiovascular disease. Vitamin E improves circulation, is needed to repair tissue and is useful in treating premenstrual syndrome and fibrocystic disease of the breast. Vitamin E promotes normal blood clotting and healing, reduces blood pressure and relaxes leg cramps. Vitamin E enhances sperm count, maintains healthy muscles and nerves, healthy skin and hair, and reduces the risk of prostate cancer in smokers. Vitamin E is a family of eight different molecules which is first divided up into two groups (tocopherol and tocotrienol), and then is divided into alpha, beta, gamma and delta forms. The most potent is d-alpha-tocopherol. The best place to find Vitamin E is in cold pressed vegetable oils, dark green leafy vegetables, legumes, nuts, seeds, brown rice, cornmeal, kelp, organ meats, watercress and whole grains. If E is taken with iron supplements, it is best to use organic forms of iron such as ferrous gluconate or ferrous fumarate because inorganic iron destroys vitamin E.

Vitamin K – This vitamin is needed for the production of prothrombin which is necessary for blood clotting. It is also essential for bone formation and repair, prevention of osteoporosis, and aids in converting glucose to glycogen (needed sugar) for storage in the liver. Vitamin K promotes longevity. A deficiency of Vitamin K can cause internal or abnormal bleeding. There are three forms of vitamin K: K1 (phyloquinone or phytonactone) which comes from plants; K2 (menaquinone) which is made from intestinal bacteria and K3 (menadione) which is a synthetic substance. Good sources of Vitamin K are in asparagus, blackstrap molasses, broccoli, Brussels sprouts, cabbage, cauliflower, liver, oats, oatmeal, soybeans, wheat, kelp, rye and safflower oil to name a few. The best source is from the “friendly” bacteria produced in the intestines. When taking antibiotics, there is a need for dietary or supplemental vitamin K because antibiotics cause a deficiency in vitamin K.

Bioflavonoids – This is also known as Vitamin P (but it is not exactly a vitamin). It is needed for the absorption of vitamin C. Bioflavonoids can be used in the treatment of athletic injuries because it relieves pain, bumps and bruises. Vitamin P promotes circulation, has an antibacterial effect, stimulates bile and when taken with vitamin C, it reduces the symptoms of oral herpes. You can find bioflavonoids in peppers, buckwheat, black currants and the white under the skin of citrus fruit. It is also found in apricots, lemons, elderberries, rose hip and hawthorn berry.

Coenzyme Q10 – This “vitamin-like” substance is a more powerful antioxidant than vitamin E. Although there are 10 coenzymes, Q10 is the only one found in human tissue. It plays a critical role in the production of energy in every cell of the body. Q10 aids circulation, stimulates the immune system, increase tissue oxygenation and has a vital anti-aging effect. Recent research suggests it plays an important role in the prevention of cardiovascular disease. Since natural occurring Q10 declines with age, it should be supplemented in the diet. It can be found in



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mackerel, salmon, sardines, beef, peanuts and spinach. Q10 is fat soluble (penetrates or is absorbed in fat) and should be taken with oily or fatty foods.

Enzymes

Enzymes assist practically all bodily functions. Enzymes act as catalysts for biochemical reactions in the body and each enzyme has a different function. Enzymes are divided into two categories, digestive and metabolic. Digestive enzymes are secreted along the gastrointestinal tract and break down food, enabling the nutrients to be absorbed in the blood stream. These are further divided into three categories, amylase (breaks down carbohydrates), protease (breaks down protein) and lipase (breaks down fats). Metabolic enzymes catalyze various chemical reactions within the cells such as energy production and detoxification. Two very important metabolic enzymes are superoxide dismutase (SOD) which is an antioxidant and catalase, which breaks down metabolic waste and frees up oxygen for the body's use. The body produces its own supply of enzymes but they can also be obtained from foods. Taking enzyme supplements or obtaining certain enzymes from food is important to prevent enzyme depletion in the body and reducing stress on the body. Enzymes are powerful but cannot act alone. Co-enzymes from B-complex vitamins, vitamins C and E, and zinc help enzymes be fully active.

Minerals

Minerals are in every living cell and every cell is dependent on them for proper function and structure. Minerals function as coenzymes enabling the body to perform such functions as energy production, growth, and healing. Minerals keep a proper chemical balance in the body and they can be found in the earth. For instance, rocks are made up of mineral salts. Rocks and stones break down with erosion (a process that takes millions of years) and form the basis for soil. Plants grow in soil and are eaten by animals. Therefore, minerals are obtained from plants or by eating animals. Minerals are divided into two groups: bulk minerals (macrominerals) and trace mineral (microminerals). After minerals enter the blood stream they compete with each other for absorption. Too much of one mineral could deplete or interfere with another; consequently, minerals should be taken in carefully balanced amounts.

Microminerals – Although only “trace amounts” of microminerals are needed, they are nonetheless important to good health. Trace minerals include boron, chromium, copper, germanium, iodine, iron, manganese, molybdenum, selenium, silicon, sulfur, vanadium and zinc. Microminerals are needed for healthy bones, muscle growth, enhancement of brain function, alertness, utilization of energy from fats and sugars, protection against toxic substances, metabolism of glucose and fat, aids in cellular oxygenation, prostate gland function and growth of reproductive organs. Deficiencies of minerals (narrowed down to effects caused by substance use) can be associated with alcohol and caffeine consumption, cirrhosis of the liver, smoking tobacco and kidney disease.

Macrominerals – These include calcium, magnesium, sodium, potassium and phosphorus. They are vital for the formation of bones and teeth, maintaining a regular heartbeat and nerve impulses, assisting other mineral and vitamin uptake, blood clotting, cell growth, contraction of the heart muscle and its normal rhythm, maintaining a healthy nervous system and transmission of electrochemical impulses. An improper balance of minerals can cause deficiencies as well as be potentially fatal. Caution needs to be exercised in the use of macromineral supplements.



Amino Acids

Amino Acids are the building blocks that make up proteins and are the end product of protein digestion (hydrolysis). Sixteen percent of amino acid is comprised of nitrogen, making it the difference between fatty acids and sugar. Protein makes up the greatest part of the body after water. Proteins are chains of amino acids linked together with each tailored to a specific need of the body. They are not interchangeable. There are amino acids that make up or are precursors to neurotransmitters and can pass through the blood brain barrier sending and receiving nerve impulses. Amino acids allow vitamins and minerals to perform properly, for example, low levels of the amino acid tyrosine could lead to an iron deficiency. There are a total of 28 amino acids, eighty percent of which are produced in the liver (called *non-essential*); the rest come from diet (called *essential* amino acids). Bodies can produce non-essential amino acids as needed, however, a deficiency can occur if not enough protein is eaten or if protein is not properly absorbed. Deficiencies can also in situations of infection, stress, drug use, aging or an imbalance of other nutrients.

The following are Amino Acids needed specifically for recovery from AOD abuse:

Arginine – This is especially good for cirrhosis of the liver or fatty liver. It reduces the effects of chronic alcohol toxicity. It is a nonessential amino acid (produced in the liver) and can be found in carob, chocolate, coconut, dairy products, gelatin, oats, peanuts, soybeans and wheat germ.

Carnitine – Strictly speaking this is not an amino acid. It is related to the B vitamins and its main function is to help transport long-chain fatty acids and inhibit alcohol-induced fatty liver. It is best found in meat and other foods of animal origin.

Cysteine and Cystine – For each molecule of cystine, there are two molecule of cysteine joined together. Cysteine helps protect the liver and brain from damage caused by alcohol and other drugs and the toxic compounds in cigarette smoke.

Gamma-Aminobutyric Acid (GABA) – This amino acid acts as a neurotransmitter in the central nervous system. It is formed from glutamic acid and decreases neuron activity and inhibits nerve cells from over firing. GABA acts the same way as a Valium or other tranquilizers but is not addicting, and it may reduce cravings for alcohol.

Glutamine – Glutamine converts into glutamic acid and increases the GABA needed to sustain proper brain function. Due to stress or illness, a supplement of L-glutamine might be needed to enhance antioxidant protection, it decrease sugar cravings and the desire for alcohol (which is very useful for recovering alcoholics). Glutamine should *not* be taken by persons with cirrhosis of the liver.

Glutathione – Technically this is not an amino acid; it is a tripeptide that is produced from other amino acids. It is a powerful antioxidant produced in the liver where it detoxifies harmful compounds. Glutathione can diminish some of the damage caused by cigarette smoke and may protect the liver from alcohol induced damage. Supplemental glutathione is expensive so it might be better to take the amino acids that produce it (cysteine, glutamic acid and glycine).

Histidine – This is an essential amino acid which is very important in growth and tissue repair. It maintains the myelin sheath that protects the nerve cell and is needed for the production of red and white blood cells. This amino acid can be found in rice, wheat and rye.



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Lysine – An essential amino acid found in cheese, eggs, fish, lima beans, milk, potatoes, red meat, soy products and yeast. The supplement L-lysine may decrease acute alcohol intoxication.

Methionine – This essential amino acid is necessary for the breaking down of fats thus preventing fat in the liver. People with anomaly of liver function should eat foods high in methionine and or take dietary supplements to help neutralize the toxins in the liver and protect it against damaging effects of the toxins. A few foods that provide Methionine are beans, eggs, fish, garlic, lentils, meat, onions and soy.

Ornithine – This non-essential amino acid detoxifies ammonia, aids in liver regeneration, and is necessary for a proper immune system.

Phenylalanine – An essential amino acid that can cross the blood brain barrier and has a direct effect on brain chemistry. Once in the body, it is converted into tyrosine which is used to synthesize dopamine and norepinephrine neurotransmitters. This amino acid elevates mood, decreases pain and aids in memory and learning.

Serine – This non-essential amino acid is a component of brain protein and it protects the myelin sheath that covers nerve fiber. Serine can be made from glycine in the body but this requires sufficient amounts of B3, B6 and folic acid. Serine can be found in soy foods, meats, dairy products, wheat gluten and peanuts.

Taurine – Taurine is the building block for all other amino acids and a key component of bile, which is necessary for digestion of fats, absorption of fat soluble vitamins and it controls the serum cholesterol levels. Taurine is vital for utilization of sodium potassium, calcium and magnesium. It protects the brain, especially from dehydration. Excessive consumption of Alcohol hinders the utilization of Taurine. Symptoms of Alcohol withdrawal are lessened with Taurine supplements. Taurine can be found in eggs, fish, meat and milk.

Threonine – This is an essential amino acid that helps maintain proper protein balance in the body. Threonine helps prevent fatty liver, aids in treating depression and enhances the immune system. It can be found in grains.

Tryptophan – Tryptophan is needed for the production of B3 (Niacin). The brain uses B3 to produce serotonin which helps with depression, insomnia and stabilizes moods. This essential amino acid was pulled off the “over-the-counter” shelves in 1989 when the Center for Disease Control reported a link between L-tryptophan and eosinophilamyalgia syndrome (a blood disorder). As it turned out, it wasn’t L-tryptophan but rather a contaminated batch from Japan that caused this disorder. The FDA has yet to okay it back on the market without a prescription. Tryptophan may reduce some of the effects of nicotine. It can be found in brown rice, cottage cheese, meat, peanuts and soy products.

Tyrosine – This non-essential amino acid is a precursor of adrenaline, norepinephrine and dopamine, it regulates mood and stimulates metabolism and the nervous system. Supplementing with L-tyrosine reduces stress, anxiety and depression and is useful in the withdrawal from drugs. Tyrosine can be found in almonds, avocado, bananas, dairy products, lima beans, pumpkins and sesame seeds.



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Valine – it is an essential amino acid that is helpful in treating liver and gallbladder diseases. Valine is good for correcting severe amino acid deficiencies due to drug addiction. Note: excessively high levels can cause a crawling sensation under the skin and hallucinations. Valine is found in dairy products, grains, meat, mushrooms, peanuts and soy products.

Antioxidants

Antioxidants protect the body from free radicals. Free radicals are atoms or groups of atoms that cause damage to cells, to the immune system and it can lead to infections and various diseases. There are different free radicals that are formed by radiation, exposure to toxins such as found in cigarette smoke, polluted air and household chemicals. Free radical scavengers (enzymes that neutralize) keep them in check. The four most important enzymes are superoxide dismutase (SOD), methionine reductase, catalase and glutathione peroxidase. There are also phytochemicals and nutrients that act as antioxidants such as vitamin A, beta-carotene, vitamins C and E and the mineral selenium. Antioxidants are found in few foods, so in order to minimize free radical damages, it is important to use supplements.

The following are some of the antioxidants that are directly affected by AOD use:

Curcumin (Turmeric) – This phytochemical helps prevent and neutralizes free radicals and is found in the spice, turmeric. Chronic smokers who take curcumin substantially lower their mutagens (a substance that induces cells to mutate; hence, become cancerous).

Flavonoids – Flavonoids are powerful antioxidants and metal chelators (ions that bond together to form a ring). Flavonoids can be found in wine, especially red wine, as well as, fruits, vegetables, soy products and teas.

Ginkgo Biloba – This antioxidant is an herb that effects the brain, retina and cardiovascular system. Taking Ginkgo Biloba can improve long and short term memory.

Glutathione – This antioxidant is a protein that is produced in the liver. It helps with damage caused by cigarette smoking, and toxins from Alcohol. Because Glutathione is a detoxifier of metals and drugs, it aids in the treatment of blood and liver disorders.

N-Acetylcysteine (NAC) – This antioxidant contains the sulfur needed to produce glutathione. The liver uses this amino acid to detoxify chemical and other poisons, especially alcohol, tobacco smoke and other air pollutants.

Nicotinamide Adenine Dinucleotide (NADH) – This antioxidant is also known as coenzyme 1 which plays a role in DNA repair and maintenance of cellular immune defense. NADH inhibits the auto-oxidation (an increase of oxygen content) of dopamine, which causes a release of toxic chemicals that can damage sensitive parts of the brain.

Silymarin – This antioxidant is extracted from the seed of the herb milk thistle, it has been used successfully for centuries to treat liver disease. It also acts as a protection from alcohol and other drugs as well as to promote growth of new liver cells.

Herbs

Native Americans, Romans, Egyptians, Asians, Persians and Hebrew medical practices have known for centuries the benefits of herbs to cure just about any illness. Even the modern pharmaceutical industry originally was based on isolating ingredients from herbs and making



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them in a purer form. Herbalists believe that nature provides other (less potent) ingredients that act as buffers, synergists or counterbalances to work in harmony with the more powerful ingredients.¹⁴

In the early 1900's, the U.S. pharmaceutical industry began isolating individual active components to produce drugs based on them for the purpose of treating illness by conditioning the body to not allow a disease to live or thrive (Allopathy). In the past 15 years, research has shown the potential of numerous herbs as remedies. Many people have become concerned with the side effects of synthetic drugs and are choosing to take control of their own health. They are re-discovering that cooking with herbs and the aroma of herbs help balance them mentally, spiritually and physically. The benefits of herbs on tissues and organs often treat, cure or prevent diseases by nourishing the immune system; regenerating damage to the liver; strengthening the adrenal glands, countering the adverse effects of chemotherapy, balancing the endocrine system, and improving vision to identify a few.

Medicinal herbs are divided into two categories: tonics and stimulating. Tonics are used to maintain tone or balance throughout the body. They are taken over a long period of time (usually 3-9 months) to gently strengthen and improve overall health. Stimulating herbs, on the other hand, are used for specific ailments. They are stronger and are taken for shorter periods of time in smaller doses.

Herbal medicine is referred to as phytomedicine (coming from the Greek word *phyton* meaning plant).¹⁵ Phytomedicine differs from modern pharmaceutical medicines that might have originally been from plants, but are now mostly chemical compounds. In the United States, phytomedicines are sold over the counter and are not generally covered by insurance companies unless prescribed by a doctor. Herbs come in several forms from essential oils to wines. There are many herbs yet to be investigated.

The following lists some of the 15% we know about, and the focus will be on those that appear to relate directly to substance abuse:

- ❑ Annatto – the leaves, roots and seeds are used to protect the liver and kidneys and may reduce blood sugar levels (which can cause alcohol cravings).
- ❑ Ashwagandha – the roots act as a tonic to protect the immune system.
- ❑ Bayberry – the root bark helps the immune system.
- ❑ Blessed Thistle – the flowers, leaves and stems helps heal the liver.
- ❑ Boldo – the leaves act as a liver tonic and is used by indigenous peoples of Chile and Peru for liver ailments.
- ❑ Boswellia – the gum resin protects the liver.
- ❑ Burdock – the plant, root and seeds are used to restore the liver and gallbladder to normal function and to stimulate the immune system.
- ❑ Cat's Claw – the inner bark and roots of this herb stimulates the immune system.
- ❑ Cedar – the leaves and tops of cedar stimulates the immune system and acts as a lymphatic cleanser.
- ❑ Chamomile – the flowers and plant are a remedy for stress and anxiety. Chamomile can be dangerous when be taken with sedatives or alcohol.
- ❑ Chuchuhuasi – the bark is used to stimulate the immune system.

¹⁴ Balch, 2000

¹⁵ Balch, 2000



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- ❑ Dandelion – the flowers, leaves, roots and tops cleanse the blood and liver and are useful for Cirrhosis of the liver.
- ❑ Devil's Claw – the rhizome (bulb) of this herb is good for the liver.
- ❑ Echinacea – the leaves and roots are good for the immune and lymphatic system.
- ❑ Elder – the leaves, flowers, fruit, inner bark and root enhances the immune system function. The stems contain cyanide and are very toxic.
- ❑ Ephedra – the stems elevate mood and relieve depression. Do not take with MAO inhibitor drugs or if anxiety disorders are present.
- ❑ Fennel – the fruit, root and stem promote functioning of kidneys, liver, and spleen, and clears the lungs.
- ❑ Garlic – the bulb is used for enhancing the immune function and aids in liver diseases.
- ❑ Ginger – the rhizome and roots protect the liver.
- ❑ Ginkgo – the leaves of the ginkgo improve brain function and are beneficial for depression and loss.
- ❑ Ginseng – the root enhances the immune function and eases withdrawal from Cocaine. It also may help improve AOD induced liver dysfunction in adults.
- ❑ Golden Seal – the roots and rhizomes strengthens the immune system, liver, pancreas and lymphatic systems.
- ❑ Gotu Kola – the nuts, roots and seeds helps decrease depression and aid in heart and liver function.
- ❑ Green Tea – the leaves stimulate the immune system.
- ❑ Horehound – the flowers and leaves boost the immune system.
- ❑ Kava – the roots are helpful for anxiety, anxiety disorders, insomnia, and stress related disorders. Kava should not be combined with Alcohol or with certain anti-depression or anti-anxiety prescription drugs.
- ❑ Kudzu – the leaves, roots and shoots suppress Alcohol cravings.
- ❑ Lavender – the flowers relieve stress and depression. Essential oils from lavender is used in aroma therapy.
- ❑ Licorice – the roots stimulate the production of interferon (a protein that helps block viral infections). Licorice is also beneficial for depression and may prevent Hepatitis C from causing cancer or cirrhosis of the liver. Licorice *candy* does not work for purposes because the *candy* is made mostly from anise.
- ❑ Maca – the roots support the immune system.
- ❑ Macela – the aerial parts stimulate and support the immune system.
- ❑ Milk Thistle – the fruit, leaves and seeds protect the liver from toxins and pollutants. It is good for a weakened immune system and all liver disorders.
- ❑ Myrrh – the resin from stems stimulates the immune system.
- ❑ Oregon Grape – the root purifies the blood and cleanses the liver.
- ❑ Parsley – the fruit, leaves, roots and stems help the bladder, kidney and liver. Parsley contains vitamin C than oranges by weight.
- ❑ Pau d' Arco – the inner bark cleanses the blood.
- ❑ Primrose – the seed oil is helpful in treating Alcoholism by relieving hangovers and reducing cravings. It is also helpful in restoring liver and brain function.
- ❑ Puncture Vine – the flowers, fruit, leaves and stems enhance the immune system and the liver.
- ❑ Red Clover – the flowers are good for liver diseases and weakened immune systems.
- ❑ Rhubarb – the roots and stalks are good for the liver.
- ❑ Rosemary – the leaves help detoxify the liver.



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- ❑ St. John's Wort – the flowers, leaves, stems and oil are good for depression. St. John's Wort should not be taken with anti-depression prescriptions or any medication that interact with MAO inhibitors.
- ❑ Skullcap – the leaves and shoots are useful in treating Barbiturate addiction and drug withdrawal.
- ❑ Suma – the bark, berries, leaves and roots boosts the immune system. It is good for liver disease.
- ❑ Turmeric – the rhizomes protect the liver against toxins.
- ❑ Uva Ursi – the leaves are good for disorders of the liver and pancreas.
- ❑ Vervain – the flowers, leaves, shoots and stems promote liver and gallbladder health. It is also useful for mild depression.
- ❑ Wild Oregano – the leaves, shoots and stems boost the immune system. Supermarket oregano is combined with other spices and does not have the medicinal value of wild oregano.
- ❑ Wormwood – the leaves and tops are useful in liver disorders. Wormwood can become habit forming.
- ❑ Yellow Dock – the roots can be used to improve liver function.

Natural Food Supplements

Essentially, natural food supplements include a wide variety of products. They are composed of, derived from, or are byproducts of food that provide health benefits. Food supplements can be high in certain nutrients, contain active ingredients that aid in digestive and metabolic processes, or provide a combination of nutrients and active ingredients for a healthy body. There are many food supplements on the market, those identified here will be directly (i.e. detoxifiers, liver repair) or indirectly (i.e. mood, memories enhancers) related to the result of substance abuse.

- ❑ Alfalfa – this is one of the most mineral-rich foods available primarily because the roots can grow as much as 130 feet into the earth. Alfalfa (as does wheat-grass, barley and spirulina) contains chlorophyll which aids the healing of liver disorders.
- ❑ Barley Grass – this is high in calcium, iron and all essential amino acids and it helps heal pancreatitis.
- ❑ Bee Pollen – this product strengthens the immune system and helps with depression.
- ❑ Bifidobacterium Bifidum (B. bifidum) – this has been proven useful in the treatment of cirrhosis of the liver and chronic hepatitis by improving digestion relieving stress on the liver¹⁶.
- ❑ Citrin – this is an extract from the Indian berry that inhibits the synthesis of fatty acids in the liver.
- ❑ Desiccated Liver – the best source of desiccated liver is derived from beef that is organically grown. It is known to aid in the healing of liver disorders.
- ❑ Dimethylglycine (DMG) – DMG is used to treat liver disease, and alcohol and drug addiction.
- ❑ Evening Primrose Oil – also know as primrose oil. This is an essential fatty acid that is beneficial for cirrhosis of the liver. Primrose oil promotes the production estrogen and should be avoided by women with breast cancer.
- ❑ 5-Hydroxy L-Tryptophan (5-HTP) – this substance is created naturally in the body from the amino acid tryptophan and is used by the body to serotonin. This is a good supplement for L-tryptophan which has been taken off the U.S. market. Avoid 5-HTP if taking anti-depressants.

¹⁶ Balch and Balch, 2000



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- ❑ Green Papaya – unripe papaya is very beneficial for internal organs, especially the liver.
- ❑ Inositol Hexaphosphate (IP6) - also known as phytic acid, it protects the liver by preventing fatty deposits from accumulating in the liver.
- ❑ Lactobacillus Acidophilus – this “friendly bacteria” balances the intestinal flora and helps detoxify harmful substances.
- ❑ Lecithin – this is a type of lipid (free fatty acids in the blood) needed by every living cell, and it is especially useful in repairing damage to the liver caused by alcoholism.
- ❑ Maitake – this mushroom has a long history in Chinese and Japanese herbology and cooking. It helps the body adapt to stress and is useful for chronic hepatitis.
- ❑ Nicotinamide Adenine Dinucleotide (NADH) – this is a form of vitamin B3 (niacin) that is essential for the production of various neurotransmitters, particularly dopamine.
- ❑ Phosphatidyl Choline – this is helpful in preventing liver problem. It also benefits with memory loss and depression. This supplement should only be used in small doses if Bi-Polar Disorder is present.
- ❑ Royal Jelly – this is a thick, milky substance secreted from bees. It is useful for liver diseases, Pancreatitis, the immune system and insomnia.
- ❑ S-adenosylmethionine (SAmE) – this is a derivative of the amino acid methionine which is formed in the body when it combines with adenosine triphosphate (ATP). SAmE is effective as an anti-depressant; and facilitate the manufacturing of neurotransmitters. Studies by Mount Sinai School of Medicine and AOD Treatment Center in New York show alcohol’s hepatotoxicity (a tendency of an agent, usually AOD to have a toxic effect on the liver).¹⁷ This is exemplified by an alcoholic liver impairing the process methionine’s conversion into SAmE.¹⁸
- ❑ Spirulina – this microalgae produces twenty times as much protein as soybeans. Among the many benefits of spirulina, it helps cleanse and heal. Its high protein helps stabilize sugar levels which is usually associated with alcoholic cravings.

These are most of the nutritional products needed if suffering from an alcohol and other drug disease and/or associated psychological diseases. In a case of a diagnosed alcoholic, alcoholics process alcohol differently than a “normal drinker”. When alcohol reaches the liver it is converted into acetaldehyde (a harmful byproduct of alcohol metabolism that damages the liver). The “normal drinker’s” liver quickly transforms acetaldehyde into acetic acid. This in turn transforms into carbon dioxide and water and is expelled through respiration and urine. In an alcoholic liver, alcohol quickly turns to acetaldehyde and then very slowly converts to acetic acid. The acetaldehyde damages the liver.

A damaged liver is unable to absorb and utilize nutrients properly. Further, while still acetaldehyde, it travels through the blood stream and attacks the heart muscle. When acetaldehyde reaches the brain, it blocks neurotransmission activity; as well as, combining with unused neurotransmitters to form tetrahydroisoquinolines (THIQ). THIQ is similar an opiate and fits in the same receptors as endorphins. This signals the brain to stop producing endorphins and then causes the alcoholic to need more alcohol in order to maintain a feeling of well-being.

It could be surmised that proper nutrients which stimulate or aid in the production of neurotransmitters could help with alcohol and sugar cravings. And vice versa, a lack of sufficient neurotransmitters could cause a craving for alcohol or other “sugar” highs.

¹⁷ Anderson, 1994

¹⁸ Annual Review 2000



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Joan M. Larson, founder and director of Health Recovery Center (HRC) and author of *Seven Weeks to Sobriety* shows a 74% success rate of abstinence with her program.¹⁹ HRC balances the addict's sugar level and reduces cravings. Essentially, when entering HRC, an intake questionnaire and a full blood panel is done to assess biotypes. Larson feels that there are different biotypes of alcoholics and addicts and with a balanced diet that fits their need, full recovery is possible. After assessing "the type" and the damage, a treatment plan is made for foods and supplements that ease detoxification, reduces cravings and restores health. Milam and Ketcham, in *Under the Influence*,²⁰ start their patients treatment with laboratory workups to assess their nutritional needs, and plan their diet with supplements. They feel this is critical to successful treatment. Dr. Janice Phelps has treated thousands of addicts and claims 60-70% continued success rates with vitamins, minerals and herbal supplements.

Conclusion

The human body is complex and at times flawed. Nature might have dealt a bad hand, but does one need to fold the cards? Proper care of the body, mind and spirit is available. The first step in recovery might be to evaluate the "cause" before "popping a pill," and including nutrition as a component of recovery.

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¹⁹ Larson 1997

²⁰ Milam and Ketcham, 1981



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CONTINUING EDUCATION (CE) EXAMINATION QUESTIONS
Course No. CE1304P3 – Medical Treatment: Nutrition and Recovery

You are encouraged to refer to the Course Material when answering these questions. Choose the best answer based upon the information contained within the Course Material. Answers which are not consistent with the information provided within the Course Material will be marked incorrect. A score of 70% correct answers is required to receive Continuing Education credit. GOOD LUCK!

QUESTIONS

1. Each of the following statements regarding the liver is true, except:
 - a. The liver is the largest and most complex gland in the body.
 - b. The liver is served by a single blood supply.
 - c. The liver is responsible for hundreds of biochemical processes.
 - d. The liver processes hemoglobin for iron and converts ammonia to urea.

2. A general statement about vitamins and minerals that is true is:
 - a. Most vitamins and minerals are contained within the foods that may be eaten.
 - b. Most people eat a balanced diet based upon the body's nutritional needs.
 - c. Both A and B above.
 - d. Neither A nor B.

3. Vitamin A:
 - a. Slows the aging process.
 - b. Guards against cancer.
 - c. Is necessary for new cell growth.
 - d. All of the above.

4. Vitamin D:
 - a. Is required for absorption and utilization of calcium and phosphorus.
 - b. Can be acquired by sitting in the sun.
 - c. Both A and B above.
 - d. Neither A nor B.

5. Digestive enzymes are divided into three categories, which includes all of the following except:
 - a. Amylase
 - b. Protease.
 - c. Lipase.
 - d. Sophease.

6. Minerals:
 - a. Function as coenzymes enabling the body to perform such functions as energy production, growth and healing.
 - b. Are not absorbed by the body, thus can be taken in any quantity.
 - c. Both A and B above.
 - d. Neither A nor B.



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7. There are 28 amino acids, _____% of which are produced in the liver:
 - a. 20%
 - b. 50%
 - c. 80%
 - d. 100%

8. Antioxidants:
 - a. Are free radicals.
 - b. Protect the body from free radicals.
 - c. Both A and B above.
 - d. Neither A nor B.

9. Herbal medicine:
 - a. Is referred to as phytomedicine.
 - b. Differs from modern pharmaceutical medicines in that most of the latter are now mostly chemically compounds.
 - c. Both A and B above.
 - d. Neither A nor B.

10. The natural food supplements identified in this course material includes all of the following except:
 - a. Citrin.
 - b. Green Jelly.
 - c. Green Papaya.
 - d. Royal Jelly.

This is a ten-question examination. Answer Questions 1 through 10 for full CE credit in this course. Questions 11 through 21 have been omitted.



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| 2. A B C D | 9. A B C D | 16. A B C D |
| 3. A B C D | 10. A B C D | 17. A B C D |
| 4. A B C D | 11. A B C D | 18. A B C D |
| 5. A B C D | 12. A B C D | 19. A B C D |
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