

WORKSHOP: PSYCHODIETICS / BRAIN NUTRITION

INFORMATION SHEET

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Aim and theme of this training.

Outcome: If there were permanent armed robbers outside your house and the only deterrent between you and them is your guard dog, what would you feed that dog? Would you feed it bones and porridge and have a fat, lazy, lethargic dog? Or would you invest in the best dog food you can buy and have an alert, sharp, intelligent dog?

Your brain is attacked on a daily basis by stressors as dangerous as armed robbers. Stress can kill you. Would you not want your brain to function at optimal clear strength to protect your whole system? We are more concerned about anti-virus protection for our computers, than we are about preserving our own brains.

The mechanics of your brain involve neurons producing neurotransmitters (brain chemicals) which transmit from one neuron to another. Just as petrol, oil and water have different functions in an engine, so do different neurotransmitters have different functions in your brain, and they are all composed of different ingredients. Now, where do you think does your brain obtain the ingredients to make these neurotransmitters? **From the food that you eat.**

Your brain is the maestro conductor, coordinating the orchestra of your thoughts, emotions and behaviour. The triad of your thoughts, (cognition), emotions (affect) and behaviour are all three connected and regulated by your brain. If your brain functions optimally, due to healthy brain nutrition, your thoughts, emotions and body all follow suit.

The right food can alleviate depression, lift your moods, improve your memory, combat stress, provide life energy, clear thoughts and improve your overall general functioning, because it benefits your brain. Do you know which foods contain specific ingredients to achieve the above?

Research has linked bad foods to mental illnesses such as depression, schizophrenia, ADD, bipolar disorders and general cognitive decline as we age. However it has also linked good brain food to amazing cognitive improvements.

Did you know you can deter cognitive decline with several years, by eating berries and spinach? Did you know that watermelon and blueberries can be a remedy for erectile dysfunction? Did you know research indicated a child's IQ raised by eliminating sugar from the diet?

A game changer is to start thinking about the nutritional value food offers your brain, and not about the tastes you are addicted to. Shift your thinking from your body to your brain. Stop thinking: "Is this going to make me fat?" or "I don't like the taste of this." Start thinking: **"Is this good food for my brain?"** Good brain food will not make you fat, anyway. On the contrary, by eating the right food for your brain, you will lose weight anyway.

Module 1: NEUROTRANSMITTERS AND DEFICIENCIES: MENTAL DISORDERS.

Outcome: Your brain operates by the synthesis / production of different neurotransmitters in the synaptic end of the neuron, and these neurotransmitters then being spewed out into the synaptic cleft / space, where they swim to find their docking stations at the next neuron and so the transmission process proceeds. A message is relayed from one neuron to the next, and translated into thought, emotion or action.

It stands to reason that if something goes wrong in the production process or in the transmission of these neurotransmitters, then your brain cannot function properly and you may develop mental disorders, experience emotional turbulence and behave strangely. A genetic predisposition can also be the cause, but the environment eg toxins or lifestyle can influence the expression of the gene. You are not at the mercy of your genes. So your brain is experiencing mechanical problems ...

1.1 An external solution drugs. Let's flood the brain with external chemicals with potentially dangerous side effects

Outcomes: Psychiatric drugs were developed with the aim to regulate the activities of the neurotransmitters in the synaptic cleft – the space between the neurons. We briefly look at the different types and generations of psychiatric drugs, eg:

SSRI's, the psychic energizers;

Benzodiazapines, the tranquilizers;

Monoamine Oxidase Inhibitors (**MAOI**)

So, psychiatric drugs remain foreign molecules introduced to the brain and may have many dangerous side-effects.

Warning: It will be dangerous and irresponsible for patients taking psychiatric medication to immediately cease taking them or reduce dosages without medical supervision. Side effects should be discussed with the prescribing doctor. Perhaps a change in diet could alleviate symptoms before we run to medication as a quick fix.

Module 2: CAN OUR INTAKE OF FOOD INFLUENCE OUR NEUROTRANSMITTERS?

Outcome: Historical brief on research pertaining to the influence of foods on neurotransmitters. Pioneers JD Fernstrom and RJ Wurtman.

The World Health Organization found in 2014 that 350 million people are affected by depression. Meta-analysis studies found that omega 3 as found in fish like salmon, tuna, sardines and mackerel cause a major reduction in major depressive disorder. Omega 3 also enhances memory function.

2.1 Serotonin

Serotonin is an inhibitory neurotransmitter, stabilising your mood, regulating carbohydrate cravings, sleep cycle, pain control, and digestion. You may be prescribed (SSRI's) Selective Serotonin Reuptake Inhibitors – when you are depressed. Serotonin is a natural anti-depressant and a deficiency can also cause anxiety disorders, schizophrenia, obsessive-compulsive disorder and violence and feelings of guilt, fear and loneliness. Learn which foods contain the basic ingredients of serotonin.

2.2 Dopamine

Dopamine leads to the anticipation of pleasure and the rewards it promises, motivating you to move towards that which you desire. When dopamine receptors are blocked it can lead to Parkinson's disease (a neuro-motor disease), restlessness, pacing, fidgeting, anxiety, irritability, anger, problems concentrating, muscle contractions, fear, developing of male breasts, depression and a low libido. Too little dopamine leads to that awful feeling where you have nothing to look forward to. Learn which foods contain basic ingredients to produce dopamine

2.3 Norepinephrine

Norepinephrine can be taken as the "adrenalin" produced by the brain. It is an excitatory neurotransmitter responsible for the stimulatory process in the brain. Norepinephrine is linked to vigilance, monitoring and response to threat. When there is too little norepinephrine, we experience a drop in energy, cannot focus and we suffer disturbed sleeping patterns. The right amount of norepinephrine keeps our explicit memories (hippocampus) and our implicit memories (amagdala) intact, but too much or too little can affect memories. Learn which foods promote the production of norepinephrine.

2.4 Acetylcholine

Choline is an essential nutrient, required to make acetylcholine, involved in memory, mood, intelligence, muscle movement regulating heartbeat, etc. Studies link choline intake to improved brain function, better memory and processing. Choline affects the liver, nervous system and metabolism and promotes cell structure and cell messaging. Inadequate choline may result in fat and cholesterol accumulating in the liver. Learn which foods contain ingredients of choline.

Module 3: NUTRIENT THERAPY: DR WILLIAM WALSH (2012)

Outcomes: Dr Walsh's nutrient / biochemical therapy is based upon the premises that nutrient imbalances or deficiencies can be determined by tests (blood / urine tests) and that therapy be aimed to address those deficiencies through diet, with medication as a last resort. Some deficiencies may be lacking due to genes. An overload of nutrients can also cause mental illness. Careful metabolic analysis of an individual would therefore provide a more accurate profile and result in accurate treatment. (Walsh, 2012)

Depression, anxiety, irritability and bad moods, ADD, schizophrenia, post partum depression, bipolar disorder, autism and violent behaviour can be attributed to bad diet.

3.1 Nutrient deficiencies Dr Walsh identified and their consequences.

Copper/zinc; vitamin B6; Vitamin D; Methyl/Folate; Amino Acids, Fatty acid imbalances can lead to depression, obsessive-compulsive disorder, ADHD, anxiety and sleep disorders, schizophrenia, bipolar disorders.

3.2 Dr Walsh' research indicates that different depression may occur due to several different deficiencies in the diet

3.2.1 Undermethylated depression may not be recognised because patients seem self-motivated, are very perfectionistic and are very strong willed. However, they also have a high suicide rate.

3.2.2 Low folate depressive patients may report many food allergies, tend to be hyperactive and underachievers.

Elevated copper level depressive symptoms may include skin sensitivities, sleep disorders, anxieties and an intolerance to seafood and chocolate.

3.3.3 Oxidative stress can cause depression. The symptoms of oxidative stress depression are mood swings, rage, lack of coping skills, social withdrawal, inability to tan and sunburn, a sensitivity to light and belly fat.

"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." Carl C Pfeifer, PhD, MD, *Mental and Elemental Nutrients* p12.

Dr Walsh warns that nutrient therapy should not be administered by unqualified persons. (William Walsh. 2014. Nutrient Therapy. Skyhorse.)

Module 4: BEST BRAIN FOODS

4.1 *Fish*

Research indicates the omega 3 fatty acids found in fish oil may alter the microstructure of the brain membranes and modify the activity of the neurotransmitters, dopamine and serotonin. Another study suggests omega 3 may have long-term neuro-developmental effects that can ultimately reduce antisocial, violent and aggressive behaviour problems in children. Another study indicates that omega 3 supplements are not enough to stop cognitive decline.

4.2 *Nuts*

Research found that tree nuts lowers the risk of cardio-vascular disease. They reduce blood pressure and improve blood flow.

4.3 *Seeds*

Flax seeds are rich in fibre, phytochemicals, tryptophan, thiamine and omega 3. Hemp seeds contain zinc and iron. So do sesame and pumpkin seeds, but they contain copper as well. Sunflower seeds contain tryptophan. The magnesium in pumpkin seeds may reduce migraine by relaxing the nerves and blood vessels around the brain.

4.4 *Avocado*

Rich in tryptophan, potassium, fiber, vitamins K, C and E, riboflavin, niacin, folate, and phytonutrients. Remember folate and copper imbalances can cause depressions.

4.5 *Blueberries*

Research indicates people who consume strawberries and blueberries have a slower cognitive decline, than those who do not. Another study found the flavanoids in blueberries, cherries, blackberries, radishes and blackcurrants reduce the risk of erectile dysfunction.

4.6 *Dark chocolate / Cacao*

Contains manganese, calcium, copper, zinc, niacin and iron as well as anti-oxidants and flavanoids. 25g dark chocolate contain more anti-oxidants than a cup of green tea, an apple and a glass of red wine. It releases endorphins – the feel good opioids - in the brain.

Module 5: WHAT HAPPENS TO FOOD WE EAT?

Outcome: We learn about macronutrients, micronutrients

5.1 *Macronutrients are: Proteins, Carbohydrates and Fats/lipids*

5.1.1 *Proteins*

Proteins are made from amino acids. They do not produce much energy. There are 8 essential amino acids that the body needs to obtain through food, as it cannot produce these on its own. Some of these, like tryptophan and phenylalanine are essential ingredients/precursors for serotonin, the neurotransmitter that calms you down and acts as a natural anti-depressant. Proteins are found in animal products, such as milk, cheese, meat and fish and some are plant products such as vegetables, nuts and fruit.

Malnutrition is prevalent when people, especially children survive on a diet of mainly starch – carbohydrates, with virtually no intake of proteins. Even obese people can suffer from malnutrition.

5.1.2 *Carbohydrates:*

Carbohydrates consists of sugars, starch and cellulose (fibre.)

Carbohydrates are broken down to produce fuel/ glucose and provide energy. Brain cells almost exclusively use glucose as petrol / energy.

When we eat, carbohydrates are broken into glucose, our blood sugar increases and this stimulates the pancreas to produce insulin. Insulin then separates the glucose out of the bloodstream and diverts it to the liver and the muscles. Insulin also shunts the glucose to the fat cells, where it is burned for energy, or stored as glycogen (fat). Glucose should stay in those cells and not leak out.

Good complex carbohydrates are found in vegetables. Cutting calories won't make you lose fat. Cutting out on the simple carbohydrates make you lose fat.

5.1.2.1 *When things go horribly wrong ...*

Insulin resistance occurs when the insulin no longer transports glucose to the cells. Diabetes 1 is when the pancreas fails to make insulin. Diabetes 2 is when the body cannot use the insulin. Harvard study (2016) found that people who eat fruit, vegetables and whole grain have a lower incidence of diabetes 2 than those who consume red and processed meat.

Glycemic Index (GI) refers to how fast food breaks down to sugar in the blood. Carbohydrates high in GI release glucose in the bloodstream. The higher the GI, the faster it is metabolised into sugar.

Glycemic load (GL) tells us how much carbohydrates are in the food and how much it raises the blood sugar levels.

Glycation is the process when sugar binds with a protein or lipid (fat). Sugar attacks proteins. Too much glucose causes thick carbohydrate gunk called *advanced glycation end products (AGE)* which leads to premature AGEing. Due to glycation the membranes become gunked-up, which slows down the neural communication. AGE, oxidative stress and a disturbed glucose metabolism can lead to the onset of Alzheimer's Disease.

5.1.2.2 Bellyfat: The story of ghrelin and leptin

Cortisol – the stress hormone, leads to belly fat / visceral fat. Drinking sugar drinks daily contributes to belly fat. Belly fat also produces cytokines –inflammatory proteins. Belly fat hides between your internal organs and around your waist.

Fat cells produce leptin, the hormone that suppresses appetite. Insulin resistance influences leptin resistance. When there is an imbalance of leptin, the hypothalamus is under the impression there are no fat reserves, so it will encourage you to eat, which gives rise to obesity. You continuously think you are hungry and need food, because your leptin hormones are dysfunctional. The more weight you gain, the more leptin resistant you become. Ghrelin works in tandem with leptin. Ghrelin is a hormone that regulates your metabolism. Ghrelin is the hormone that tells your brain: "I am hungry, " causing you to feel anxious. Leptin is the hormone that tells your brain: " I am satiated."

5.1.2.3 Sugar and your brain:

Too much glucose cause Advanced Glycation End products AGE, which gunk up the synaptic clefts – space – between the neurons in your brain, causing neurons to misfire and to degenerate. The brain suffers accelerated cognitive loss and may lead to Alzheimer's disease. Within three hours of consuming sugar, your brain will be invaded by this brain fog.

When your brain is glucose starved – due to diabetes – it will seek alternative fuel sources, such as lactic acid, which in turn releases free radical terrorists, which destroys neurons. Glucose deprived cells begin consuming other cells. The brain starts eating itself. Diabetes causes reduced blood flow to the brain. There is a link between depression and diabetes.

Foods that are high in sugar and fat - simple carbohydrates – increase the release of dopamine, which is the neurotransmitter also responsible for addictions and cravings. Poor nutrition is associated with Alzheimer's disease. A diet high in simple carbohydrates decreases BDNF – brain-derived-neurotropic-factor – required for generating and repairing neurons.

5.1.3 Fats / lipids

Saturated fats are solid at room temperature, eg butter. They are usually from animal products. Unsaturated fats are liquid at room temperature. They are mostly oils from plants. Fats are needed to produce membranes of cells, nerves are insulated in layers of fat, and fats are involved in blood cell formulation, immune response and heart function. Steroid hormones are formed from fats and fat provide protection under the skin. Omega 3 rich oils and fats are healthy and alleviate depression.

5.2 *Micronutrients*

Micronutrients are the vitamins and minerals needed by the brain.

5.2.1 *Vitamins*

Vitamin deficiencies, especially B6, B12 and folate and anti-oxidant deficiencies can cause mental disorders : Vitamins E and C can influence memory capabilities and have an effect on cognitive decline. Low levels of vitamins B1, B2, B6 B12 and C as well as folate in older people have been significantly associated with cognitive impairment.

We learn which foods contain which nutrients and the effects they have on the brain.

We also learn about Free radicals, causing oxidative stress and the foods rich in antioxidants combating free radicals.

5.2.2 *Minerals*

Minerals are made up of the earth's metals, and are absorbed by plants. They provide structure in bone and teeth formation and regulate the metabolism.

Module 6: INSIDE YOUR BELLY MICROBES

Outcome: In your gut lives tiny probiotics, the gut microbes, that synthesize vitamins into neurotransmitters and absorb the nutrients. These probiotics need prebiotics (high fiber foods) to fight bad bacteria and to do their job. The essential vitamins, etc are then transported to your brain via blood and water, for the neurotransmitter process to commence.

So, if your gut is healthy, your brain can produce healthy neurotransmitters

Your gut has its own "brain" called the enteric nervous system, which also has a network of neurons, neurotransmitters and proteins, just like your brain. It communicates with the brain in your skull, but when something upsets it, it can influence your behaviour – this is called reacting to your gut instinct.

Dysbiosis means your gut bacteria is sick.

Firmicutes bacteria cause obesity. Research revealed when obese mice were fed prebiotics, they lost half their body fat without changing their diets and their insulin resistance disappeared. Learn which foods contain prebiotics

Imbalances in bacteria in the gut can also lead to depression, anxiety, ADHD and mood disorders.

Module 7: LIQUIDS

7.1 *Water*

Water constitutes 40 – 70% of your body mass. Water regulates body temperature and flushes impurities from your system. If you are dehydrated then the nutrients cannot reach your brain. The brain's size, level of functioning and the brain cells will be compromised. Your brain is 75% water. When you become dehydrated, your brain actually shrinks. Even mild dehydration impacts on scholastic performance. If you are dehydrated you become drowsy, you are less alert and you feel confused. Remember your brain works with electrical impulses and water conducts electricity.

7.2 *Alcohol*

Alcohol causes brain damage. It shrinks the dendrites which means the brain cannot function and transmit messages effectively.

When the space between the neurons is gunked-up, the messages are relayed incorrectly or in a disorderly manner – that is why you slur or stumble when you are drunk. Long term and chronic alcohol abuse will cause permanent damage to your neurons. It damages the cerebellum, which controls movement. Alcohol shrinks the hippocampus, the seat of memory. Alcohol steals the amino acid: omega 3 from your brain. Omega 3 is the most important unsaturated fatty acid active in the synaptic cleft.

Alcohol causes havoc with your neurotransmitters. Brain dysfunction can persist for 6 to 18 months after initial sobriety and it can take 3 to 5 years for an alcoholic's brain to function like a non-alcoholic's. Alcohol depletes vitamin B1 (thiamine) which is necessary to convert glucose into fuel for the brain. Alcohol depletes Vitamins B1, B2, B6 and B12, C and K as well as folic acid, zinc, magnesium and potassium. Drinking alcohol is simply just a very stupid idea.

Recommended additional related courses:

- Brain basics
- Stress management
- Adolescent brain

For a full comprehensive curriculum vitae of Dr Micki Pistorius, please refer to www.mickipistorius.co.za