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## Drugs & Chemicals Intro - Part 3: Natural Introduced Chemicals

**[e.g. caffeine, sugar, foods, recreational drugs (botanical), herbs, supplements]**

One universal tip for all drug users: the less anxious you are the more likely it is to be a good and fun learning experience, as long as you're sure of [a] exactly what it is and [b] how much is safe.

### Natural Recreational Drugs (botanical)

Types of drugs:

- Alcohol
- Caffeine & other stimulants [coca/khat/guarana]
- Chocolate
- Hallucinogens
- Mescaline
- Marijuana
- Opiates
- Tobacco

### Alcohol

(ethanol) decreases glutamate and increases GABA, norepinephrine and dopamine.

The fermentation of fruit and grain sugars into ethanol is one of the earliest organic reactions employed by humanity. Alcohol has varied and diverse effects on the nervous system, including influences on membranes, ion channels and multiple neurotransmitters. It is a CNS depressant.

Good for the circulation [breaks down cholesterol] in small doses, but usually not a good drug of choice for NH. Widely varied results depend on current brain chemistry and environmental stimulus, make us prone to misunderstanding, and generally dense when it's drunk in excess. It encourages wallowing in sentiment in those who are anxious yet can inspire courage and strength in those who are not. In public bars, be careful that the problems of others on alcohol don't become yours! - Enjoy with caution, moderation, and preferably at home or with trusted friends.

Alcohol is useful for: anxiety reduction, controlling memory, emotion enhancement, confidence, euphoria. It is antiseptic, killing most bacteria and fungi and many viruses.

Side effects: decreased attention, loss of or alterations in memory, mood changes and drowsiness. Long term use can result in serious liver damage. It is extremely dangerous to use if pregnant.

Alcohol and/or benzodiazepines are not a good idea for long term use because: (a) they result in down-regulation of GABA receptors. (b) Together, they're a good combination for death.

### Caffeine and Theophylline

#### Caffeine

Is found in varying quantities in the beans, leaves and fruit of some plants, where it acts as a natural pesticide. Isolated it is a bitter, white crystalline xanthine alkaloid that is a psychoactive CNS and metabolic stimulant that temporarily prevents drowsiness and loss of alertness, increasing a person's capability for mental or physical labor.

It works by counteracting Adenosine (a neurochemical that acts to protect the brain by suppressing neural activity and also by increasing blood flow).

Caffeine can reduce the sedative and motor-incoordinating side effects of alcohol. It also intensifies and prolongs the effects of epinephrine and drugs such as amphetamine, methamphetamine and methylphenidate. It produces tolerance and withdrawal symptoms can be unpleasant as there is a reduction in serotonin levels upon cessation.

Long-term consumption of caffeine can inhibit hippocampus-dependent learning and memory, partially through inhibition of hippocampal neurogenesis.

### **Theophylline (also known as dimethylxanthine)**

It is an Adenosine receptor antagonist (see caffeine, above), a cardiac stimulant, and has anti-asthmatic effects. It can reach toxic levels when taken with fatty meals, an effect called dose dumping.

### **Coca, Khat, Guarana**

#### **Coca**

(*Erythroxylum coca*) is a plant whose leaves contain cocaine. Coca leaves are prepared either as a chew or as a tea. When chewed they produce a pleasurable numbness in the mouth, and have a pleasant, pungent taste. Coca acts as a mild stimulant and suppresses hunger, thirst, pain, and fatigue.

The leaves are traditionally chewed with ashes of the quinoa plant to increase the release of the active ingredients from the leaf. It is often used for spiritual purposes.

Besides cocaine, the coca leaf contains a number of other alkaloids, including methylecgonine cinnamate, benzoylecgonine, truxilline, hydroxytropacocaine, tropacocaine, ecgonine, cuscohygrine, dihydrocuscohygrine, nicotine, and hygrine.

Absorption of cocaine from the leaf is much less rapid and efficient than from the purified forms of cocaine and it does not cause the stronger euphoric and psychoactive effects associated with use of the drug.

### **Khat**

(*Catha edulis*) is a flowering plant containing an alkaloid called cathinone; an amphetamine-like stimulant which increases serotonin and norepinephrine.

It causes excitement, loss of appetite and euphoria. Individuals become very talkative under the influence of the drug. It increases heart rate and blood pressure. The 'comedown' can include weird dreams or visuals.

Its fresh leaves and tops are chewed or, less frequently, dried and consumed as tea. Only the fresh leaves have the desired stimulating effects, so harvesters transport khat by packaging the leaves and stems in plastic bags or wrapping them in banana leaves to preserve their moisture and keep the cathinone potent.

### **Guarana**

(*Paullinia cupana*, *P. crysan*, *P. sorbilis*) is a plant of the maple family. Its open fruits look remarkably like eyeballs.

Guarana is an effective stimulant and appetite suppressant; it contains about twice the caffeine (as guaranine) found in coffee beans. It improves memory retention, alertness, and physical endurance.

Guarana contains about twenty additional alkaloids including choline, theophylline and theobromine. Guarana should not be taken with any products containing ephedra. Serious adverse effects have been reported with this combination. It may increase the risk of stroke, hemorrhage, myocardial infarction, and sudden death and has been associated with increases in heart rate, blood pressure, interference with blood clotting function and potentially harmful changes in glucose and potassium levels.

It is dangerous in soda drinks or when mixed with sugar, and in excess can cause seizures.

### **Chocolate**

Is made from cocoa beans, seeds of the cacao tree.

Substances present in cocoa include serotonin, tryptophan, phenylethylamine, tyramine and cannabinoids. It's also a good source of antioxidants and improves cardiovascular health.

However, there is a big difference between cocoa/good quality dark chocolate and the kind of chocolate candy most people buy. Basically the more sugar put into chocolate, the less healthy it becomes, and the ratios of sugar to cocoa determine whether the product is harmful or helpful. Pure cocoa powder mixed with honey and cream gives a healthy product, whereas a 'chocolate' bar that is mainly sugar will only help you towards metabolic syndrome and diabetes. So stick with the home made cocoa drinks (use honey) and only eat high quality chocolate with a low sugar content (usually Swiss or Belgian).

□

### **Hallucinogens**

**Magic Mushrooms ('Shrooms')**

There are over 180 species of magic mushrooms, the most common forms are species called *psilocybe semilanceata* or 'liberty cap', and *psilocybe cubensis*, while a more potent variety is *amanita muscaria* or 'fly agaric'. There are deadly poisonous species of *amanitas*, so if you don't know what you're doing, it's wise not to eat the red and white spotty ones!

Psilocybin mushrooms (also called psilocybian mushrooms or *teónanācatl*) are fungi that contain the psychoactive substances psilocybin and psilocin, and occasionally other psychoactive tryptamines.

They are generally not considered as powerful as LSD or PCP. They are non-addictive although they do create short term increases in tolerance. The effects can take between 30 minutes to two hours to happen. The strongest part of the trip takes 4-10 hours and the after-effects usually last a further 2-6 hours. The more you take, the longer your trip could last.

Psilocybin mushrooms can make you feel confident, relaxed and in good spirits. They can distort colour, sound and objects. One effect can be that of synesthesia so that, for example, you can hear colours and you can see sounds. They can also speed up and slow down your sense of time and movement. You may feel like you're dreaming when you're awake. You can feel more emotionally sensitive. Some people become creative and feel enlightened.

Shrooms are generally purchased in dried form. They have a very disgusting taste. If they are made into tea and the sediment strained off, the common side effect of nausea can be avoided.

There is a large percentage of "psilocybin mushrooms" available on the market which actually are not psilocybin mushrooms at all, but are simply any old fungus treated with LSD or similar. Therefore unless you pick your own you have no idea what you are actually taking.

There are several accounts of psilocybin mushrooms sending OCD (obsessive compulsive disorder) and depression into complete remission immediately and for up to months at a time, but people with high cortisol levels do not do well on magic mushrooms. You should feel comfortable, confident and safe when choosing to use them, as they can be mood enhancers bigtime. Never take hallucinogens if you are feeling depressed or paranoid unless you are well experienced, have organized the session as a deliberate hack and are working with someone you totally trust in a safe space.

Some people use psilocybin and other types of shrooms for spiritual purposes.

About one-third of volunteers in a carefully controlled new study (2009) had a "complete" mystical experience after taking psilocybin, with half of them describing their encounter as the single most spiritually significant experience in their lifetimes.

The effects persisted for at least two months. Eighty per cent of the volunteers reported moderately or greatly increased well-being or life satisfaction. Relatives, friends and colleagues confirmed the changes.

However, capacity for this sort of experience can largely depend on physiology (wiring) and psychology (expectations) as well as a number of epigenetic factors in the environment and context.

The safest way to use shrooms for medicinal or spiritual purposes is to make sure anxiety is low before proceeding.

### **Mescaline**

Occurs naturally in the peyote cactus (*Lophophora williamsii*), the san pedro cactus (*Echinopsis pachanoi*) and the peruvian torch cactus (*Echinopsis peruviana*), and in a number of other members of the cactus family. It is also found in small amounts in certain members of the bean family, including *Acacia berlandieri*.

In traditional peyote preparations the top of the cactus is cut at ground level, leaving the large tap roots to grow new 'Heads'. These 'Heads' are then dried to make disk-shaped buttons. Buttons are chewed to produce the effects or soaked in water for an intoxicating drink. However, the taste of the cactus is bitter, so users will often grind it into a powder and pour it in capsules to avoid having to taste it. The effective human dosage is 300–500 milligrams of pure mescaline. Hallucinations occur at 300–600 mg, which is the equivalent to approximately 9–20 small peyote buttons (the average 3 inch button contains about 25 mg mescaline).

The active ingredient is 3,4,5-trimethoxyphenethylamine; a naturally occurring psychedelic alkaloid of the phenylethylamine class.

Mescaline binds to, and activates the serotonin 5-HT<sub>2A</sub> receptor. Hallucinations are somewhat different from those of LSD, typically intensifications of the stimulus properties of objects and sounds. Prominence of color is distinctive, appearing brilliant and intense. Placing a strobing light in front of closed eyelids can produce brilliant visual effects at the peak of the experience. Recurring visual patterns observed during the mescaline experience include stripes, checkerboards, angular spikes, multicolored dots, and very simple fractals which turn very complex. As with LSD, synesthesia can occur especially with the help of music. An unusual but unique characteristic of mescaline use is the "geometricization" of three-dimensional objects. Objects can appear flattened and distorted.

Mescaline is often used for spiritual purposes.

### Marijuana

**Cannabis** increases dopamine, anandamide, endorphins and acetylcholine, decreases GABA. The major psychoactive chemical in cannabis is THC (tetrahydrocannabinol), and at least 66 other cannabinoids are also present in cannabis, including CBD (cannabidiol), CBN (cannabinol) and THCV (tetrahydrocannabivarin).

**THC** acts on neuron conduction, stimulating polysynaptic transmission. Another chemical present in cannabis is cannabidiol (CBD) which may have anti-psychotic properties. Anandamide is involved in regulating mood, memory, appetite, pain, cognition, and emotions.

Cannabinoids are useful for: Controlling memory, euphoria, giddiness, relaxation, offsetting the dangers of tobacco, relieving nervous asthma, lowering blood pressure and blood sugar, sedation and pain-relief. For some people they are also useful for anxiety relief.



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There is a genetic factor that determines your response to cannabis and about a third of the population cannot easily tolerate it. There is a possibility this can be hacked with epigenetics and so far (2009) the most promising way is via serotonin increase.

Marijuana may come as "Grass" (the dried weed), as solid resin (cannabis), or as oil. It is usually smoked but can be baked into cookies in which case the high is stronger.

It enhances creativity and imagination, and can be a powerful anxiolytic in small amounts, relieving depression and nervousness. But the same rules apply as for hallucinogens -marijuana can be a strong mood enhancer and is not a nice drug to take if you start off feeling paranoid. Work on anxiety reduction first to ensure a fun, pleasant high.

Cannabis can be used for hacking the genome, as it affects the transcription factors for glucose metabolism in the same way as calorie restriction, curiously while also stimulating appetite! Once this is done (needs regular low dosage together with low GI foods), you can have the delightful situation of being able to eat pretty much anything without putting weight on. You'll know it's worked when your temperature and blood pressure maintain themselves at a level slightly below what is considered 'normal' (your standard body temperature will be between 35 and 36 degrees and your resting BP will be around 114/80).

Cannabis is used medicinally for treatment of glaucoma, appetite stimulation, pain relief and anxiety. Synthesized cannabinoids are also sold as prescription drugs, including Marinol (dronabidol) and Cesamet (nabilone). Some studies have also found that moderate cannabis use may protect against head and neck cancers as well as lung cancer and breast cancer.

Recently [2008] research has found that specific elements of marijuana can be good for the aging brain by reducing inflammation there and even stimulating the formation of new brain cells. THC joins nicotine, alcohol and caffeine as agents that, in moderation, have shown some protection against inflammation in the brain that might translate to better memory late in life

Long term or overuse though can result in loss of short term memory, sensorimotor coordination problems, paranoia and loss of confidence. These effects will happen sooner and on lower doses if you are sleep deprived or on poor nutrition.

### Opium

Is formed from the latex released by lacerating (or "scoring") the immature seed pods of opium poppies (*papaver somniferum*). Opium is a complex chemical cocktail containing sugars, proteins, fats, water, meconic acid, plant wax, latex, gums, ammonia, sulphuric and lactic acids, and numerous alkaloids, most notably morphine (10%-15%), codeine (1%-3%), noscapine (4%-8%), papaverine (1%-3%), and thebaine (1%-2%). All of the latter, apart from thebaine, are used medicinally as analgesics.

Opium is usually smoked, but also comes as tincture, laudanum, paregoric, herbal wine, powder, syrup and extract. Opium wine is made by combining sugar or honey, white wine, cinnamon and cloves. Opium syrup is made by combining 997.5 part sugar syrup or honey with 2.5 parts opium extract. To make opium extract, 20 parts water are macerated with 1 part raw opium which has been boiled for 5 minutes.

Opium increases dopamine and endorphins, decreases GABA. It was probably the world's first authentic antidepressant.

Unlike other pain-relieving agents such as ethyl alcohol, ether or the barbiturates, opium doesn't impair sensory perception, the intellect or motor co-ordination. Pain ceases to be threatening, intrusive and distressing; but it can still be sensed and avoided. At lower dosages, opium may be pleasantly stimulating rather than soporific. Throughout most of history, Opium was viewed as a medicine, not a drug of abuse.

Opium is sometimes used for spiritual purposes, and has led to some strong experiences.

Opiates are useful for: The opioid analgesics are of inestimable value. They also relieve coughs, spasms, fevers and diarrhea. They promote relaxation, comfort, imagination enhancement, emotion enhancement, confidence and creativity. Some mild users treat opium as a mood-brightening smart-drug, but the serious problems with tolerance and addiction have to be considered.

The endogenous opioid system, like any other neurotransmitter system, is not immune from dysfunction. Enkephalins are critical to &quot;basal hedonic tone&quot; i.e. whether we naturally feel happy or sad, anxious or calm. Yet the implications of a recognition that dysfunctional endogenous opioid systems underlie a spectrum of anxiety disorders and depression are too radical - at present (2009)- for the medical establishment to contemplate.

A number of neurohackers have found that only feel truly well on opioids. In effect, they self-medicate, taking responsibility for their own mental health in defiance of medical orthodoxy. Such users are careful to avoid dependence and administer the drug orally, nasally or by smoking; not intravenously.

### **Tobacco**

Is processed from the leaves of plants in the genus *Nicotiana*. Nicotine is an alkaloid found in the nightshade family of plants (*solanaceae*) which constitutes approximately 0.6–3.0% of dry weight of tobacco.

Nicotine is remarkable in that it is both a stimulant and relaxant. It increases dopamine, glutamate, norepinephrine, vasopressin, endorphins and acetylcholine (and if taken with fluoxetine, also increases serotonin). It inhibits MAO (mono amine oxidase) and this is the reason for tobacco addiction (nicotine by itself is not addictive).

There are various forms of consumption, including smoking, chewing, and snorting. It is poisonous if eaten. As nicotine enters the body, it is distributed quickly through the bloodstream and can cross the blood-brain barrier. On average it takes about seven seconds for the substance to reach the brain when inhaled. Initially effects last for around two hours, but tolerance develops quickly.

Unadulterated tobacco (organic, rolling or pipe) is a lot safer than packet cigarettes. Packet cigs contain almost 600 additives! Many of the additives are responsible for the dangers of smoking and inhaling second-hand smoke. If you smoke, the first move in improving your health is to learn to roll your own.

Nicotine enhances concentration and memory due to the increase of dopamine, norepinephrine

and acetylcholine. It also appears to enhance alertness and focus due to the increase of acetylcholine and norepinephrine. Arousal is increased by the increase of dopamine and norepinephrine. Pain is reduced by the increases of acetylcholine and beta endorphin. Anxiety is reduced by the increase of endorphins. Nicotine also extends the duration of positive effects of dopamine and increases sensitivity in desire & motivation systems.

Tobacco is useful for: Attention and concentration enhancement, focus, anxiety reduction, reflex enhancement.

Side effects are well known and largely due to oxidation; if you use nicotine you should use lots of antioxidants. It is actually safer to smoke nicotine with small amounts of cannabis than without!

A second problem with tobacco is that it increases the likelihood of blockages and problems in the circulatory system (heart disease, stroke etc). Small amounts of alcohol offset these problems, but the habitual smoker can find keeping things balanced and in moderation is complex, particularly if not on a low-GI diet.

What's more, too much tobacco causes high levels of carbon monoxide in the blood, reducing the oxygen supply to the brain. This can be offset by taking digoxin or glyceryl trinitrate, but none of this solves the problem of extra free radicals created by almost all of these drugs.

None of this, however, is as harmful as anxiety. If you're using tobacco as an anxiolytic, bear all the above in mind, and remember if you stop, you'll have to replace it with something, otherwise the anxiety will kill you long before the tobacco would have.

Electronic cigarettes are an alternative to tobacco smoking, although no tobacco is consumed. It is a battery-powered device that provides inhaled doses of nicotine by delivering a vaporized propylene glycol/nicotine solution.

### **Other Drugs Herbal & Plant Derived**

#### **Herbs for the Brain**

##### **Nervine Tonics**

Strengthen and boost the nervous system. In cases of shock, exhaustion or nervous debility, the nervine tonics strengthen and feed the tissues directly; they can for many replace tranquillisers or other drugs to ease anxiety or depression.

Oats, Damiana, Skullcap, Vervain, Wood betony

##### **Nervine Relaxants**

Black cohosh, Black haw, California poppy, Chamomile, Cramp bark, Hops, Hyssop, Jamaican dogwood, Lady's slipper, Lavender, Lime blossom, Mistletoe, Motherwort, Pasque flower, Passion flower, Rosemary, St. John's Wort, Skullcap, Valerian.

Coriandrum sativum L. has been recommended for relief of anxiety and insomnia.

##### **Nervine Stimulants**

Kola Nut, Coffee, Mate tea, Black tea, Peppermint, Chinese Ginseng, Ginkgo Biloba

Throughout the day, your brain fills up with adenosine, a chemical connected with mental fatigue. Caffeine blocks the brain's adenosine receptors, countering the chemical's dulling effects. It also inhibits an enzyme that regulates cellular energy. To maximize alertness and minimize jitters, keep those receptors covered with frequent small doses rather than a onetime blast. Test subjects reported that periodic small shots made them feel clearheaded and calm, both of which enhance mental performance.

If you smoke tobacco the effects of caffeine only last half as long. If you're on oral contraceptives, the effects last twice as long. Caffeine is addictive and does have withdrawal symptoms.

##### **Rosemary**

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It may have an effect on the brain when the scent is inhaled. Some people swear that just sniffing rosemary wakes up their brain. We're waiting to see research on this, but in the meantime, what can it hurt to try it? If you have rosemary in your spice rack, go give it a sniff.

**Cholinergics/ acetylcholinesterase inhibitors [stimulate production/ duration of acetylcholine]**

Chinese Moss [Huperzine A], Nicotine [tobacco]

**Hypnotics [hypnotics will induce sleep; not hypnosis]**

Hops, Jamaican dogwood, Mistletoe, Passion flower, Skullcap, Valerian, Wild lettuce

**Oxytocics [stimulate production of oxytocin]**

Beth root, Blue cohosh, Golden seal, Rue, Squaw vine

**Sedatives [Calm the nervous system and reduce anxiety throughout the body]**

Black cohosh, Black haw, Bladderwrack, Blue cohosh, Blood root, Boldo, Bugleweed, Chamomile, Cowslip, Cramp bark, Hops, Jamaican dogwood, Lady's slipper, Lobelia, Motherwort, Pasque flower, Passion flower, Red clover, Red poppy, Saw palmetto, Skullcap, St. John's Wort, Valerian, Wild Cherry, Wild lettuce, Wild Yam. *Persea americana* (avocado) has relaxant and anticonvulsant properties, especially in the leaf

**Serotonergics [stimulate production of serotonin]**

Bananas, Griffonia *Simplicifolia*

▣ **Supplements for memory**

B Vitamins especially B3 [Nicotinamide belongs to a class of compounds called HDAC inhibitors, which have been shown to protect the central nervous system], Gotu Kola, Lecithin, Omega 3

### Food & Nutrition

#### Foods for the Brain

Cherries on the "No-Cake"

Blueberries, Broccoli, Figs, Goji Berries, Guavas, Oily fish, Quinoa, Raspberries, Strawberries, Walnuts, fruit & veg and on the whole, a low GI diet.

#### Fish

Fish is one of the brain foods that has both immediate and long-term benefits. It has been shown that brain waves actually speed up after a meal that includes fish. The fish oils also help keep arteries clean, preventing a major cause of brain problems: reduced blood flow to the brain. Many types of fish contain lots of omega-3 fatty acids and fish oils. Plain tuna from the can may be the easiest and cheapest way to include fish in your diet. Otherwise, wild-caught salmon are a great source.

Be aware, though, that many fish - both wild caught and farmed - now contain mercury, which is a brain toxin. So unless you are eating trout caught from high mountain streams with pure water, you should probably limit your fish intake to no more than three times weekly. That amount has been shown to be good for the brain.

#### Vegetables

Vegetables are a great source of beneficial vitamins, fiber and antioxidants. Vitamins nourish the brain cells. Antioxidants prevent or slow oxidative damage to our body, including the brain. When cells use oxygen, they produce "free radicals," harmful by-products which cause damage. As "free radical scavengers," antioxidants prevent and repair the damage done. Finally, fiber reduces the build-up of toxins in the body (and brain) by keeping the body cleaned out.

#### Fruits

Fruits are a great food for all the same reasons as vegetables. Some of the fruits that are richest in antioxidants are Raspberries, blackberries, cherries, plums, red grapes, kiwi and oranges. Though many do not think of them as one, avocados are a fruit, and in addition to being rich in antioxidants they contain a lot of protein.

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Fruit can be expensive in some parts of the world. If that is true where you are, you may want to check out the prices of frozen fruit, which is often cheaper. It can be blended with orange juice and a banana for a morning “smoothie.”

### Water

One of the best brain foods is not a food, but plain water. Dehydration is more common than most think, with mild headaches one of the first symptoms. Your brain is about 80 percent water, and it needs enough to function at its best. Longer term, even slight dehydration can raise stress hormones, damaging your brain over time.

Consult the Nutrition section of the library to learn more about the GI diet and how to choose foods that augment your intelligence.

### Vitamin and Mineral Supplements

Groups who are particularly prone to vitamin and/or mineral deficiency are:

- Young children on a poor diet
- Pregnant women on a poor diet
- Elderly people on a poor diet
- Those who are seriously ill due to injury or long term illness
- Those who have disorders that impair their ability to absorb nutrients from the digestive tract
- Individuals unable to eat or drink normally for whatever reason
- Individuals using excess drugs/alcohol/sugar/diuretics

Vitamin & mineral supplements are best absorbed in a chelated liquid form. Many multivitamin tablets now come in fish oil, and these are preferable. Additional vitamins and minerals taken with “smart pills” greatly increase their action.



Here is a list of vitamins & minerals and what they do:

### **Vitamin A**

Needed for growth, healthy skin and surface tissues, eyesight & night vision, bones, hair, fertility and immunity. Antioxidant. Protects against many forms of cancer.

- Where can you get it? Eggs, carrots, melon, watercress, cabbage, pumpkin, tomatoes, broccoli, apricots, mangoes.
- Deficiency signs: mouth ulcers, poor night vision, acne, frequent infections, dry flaky skin, dandruff, thrush or cystitis, diarrhea.
- Overdose symptoms: Dry skin, nosebleeds, hair loss. DANGEROUS WHEN PREGNANT.

### **Vitamin B1 [Thiamine]**

Needed for: energy production, proper functioning of brain and nervous system, heart and muscles & digestion.

- Where can you get it? Pork, chicken, venison, wholemeal bread, watercress, courgettes, whole oats, peas.
- Deficiency signs: tender muscles, eye pain, irritability, poor concentration, poor memory, constipation, tingling hands or legs, rapid heartbeat. Beriberi [severe]
- Overdose symptoms: Extremely rare, but may cause serious allergic reactions.

### **Vitamin B2 [Riboflavin]**

Involved in the release of proteins from nutrients, helps to maintain nervous system and muscles, and healthy skin, hair, nails and eyes.

- Where can you get it? Eggs, pork, chicken, venison, milk products, leafy vegetables

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- Deficiency signs: burning or gritty eyes, photosensitivity, sore tongue, dull or oily hair, eczema or dermatitis, split nails, cracked lips.
- Overdose symptoms: not known, but excess turns urine bright green.

### **Vitamin B3 [Niacin/Nicotinic acid]**

Essential for the utilisation of energy from food, brain function, and skin health. Essential for production of oestrogen, progesterone and testosterone. It controls the body's synthesis of some fats and is used to treat high levels of cholesterol and triglycerides.

- Where can you get it? Fish, mushrooms, chicken, cabbage, wholemeal bread, courgettes, turkey, whole oats, peanuts, peas
- Deficiency signs: Pellagra [severe]
- Overdose symptoms: Liver damage, gout

### **□ Vitamin B6 [pyridoxine]**

Necessary for blood formation. Natural antidepressant and diuretic. Important for memory and LTP. Essential for regulating cells in the nervous system. Helps the body to process proteins, fats and carbohydrates. Helps balance sex hormones and control allergic reactions.

- Where can you get it? Pork, chicken, venison, fish, wholemeal bread, brown rice, whole oats, bananas
- Deficiency signs: poor dream recall, water retention, tingling hands, depression, nervousness or irritability, muscle tremors or cramps, fatigue, flaky skin.
- Overdose symptoms: Nerve damage, leading to numbness and impaired physical coordination.

### **Vitamin B12 [cyanocobalamin]**

Vital for the growth of blood cells in the bone marrow. Essential for a healthy nervous system. Needed for synthesis of DNA. Eliminates toxins.

- Where can you get it? Milk, pork, chicken, venison, fish, eggs, yeast, oysters, shrimps, turkey, cheese.
- Deficiency signs: poor hair condition, eczema or dermatitis, irritability, fatigue, constipation, sore muscles, anxiety and tension. Pernicious anemia (severe).
- Overdose symptoms: not known

### Vitamin C

Makes collagen. Strengthens tissues. Needed in the formation of bones, teeth, ligaments and blood vessels. Helps your body to use iron. Assists the immune system to fight disease. Strong antioxidant. It is used up more quickly during healing and repair.

- Where can you get it? Almost all fruits and vegetables.
- Deficiency signs: frequent infections especially colds, bleeding gums, easy bruising, nose bleeds, slow wound healing, red pimples on skin. Scurvy [severe]
- Overdose symptoms: diarrhea

### Vitamin D

Enhances calcium absorption for strong teeth & bones. It is used in hyperthyroidism.

- Where can you get it? Go outside. We synthesize it in response to sunlight. Other sources are oily fish and dairy products.
- Deficiency signs: Osteomalacia and Rickets [severe]
- Overdose symptoms: DANGER –Excessive intake can cause a dangerous rise in the level of calcium in the blood, this can prove fatal.

### ▣ Vitamin E

Protects tissues and organs against degenerative disease. It is an important antioxidant, meaning that it protects cell membranes including skin from the damaging effects of free radicals that cause tissue damage. Protects against blood clots, thrombosis, atherosclerosis.

- Where can you get it? Vegetables, eggs, fish
- Deficiency signs: lack of sex drive, fatigue, easy bruising, slow wound healing, varicose veins, loss of muscle tone, infertility.
- Overdose symptoms: Diarrhoea and abdominal pain

### ▣ Vitamin K (phylloquinone)

Essential for proper blood-clotting in injury. Necessary for bone formation.

- Where can you get it? Leafy green vegetables, pork liver or liver pate, cauliflower, peas, watercress, tomatoes, also formed by your own intestinal bacteria
- Deficiency signs: Haemophilia [severe]
- Overdose symptoms: none known

### ▣ Folic Acid

- Contributes to healthy cells and blood, and essential for brain and nervous system function. Is used to prevent neural tube defects in pregnancy in those susceptible. It is also of some use in treating heart disease.
- Where can you get it? Leafy green vegetables, pork liver or liver pate, wholemeal bread, brown rice, whole oats, nuts, avocados.
- Deficiency signs: Anemia, eczema, cracked lips, greying hair, tension and anxiety, poor memory, lack of energy, stomach pains, depression.
- Overdose symptoms: None known

### Minerals

#### Calcium

Necessary for healthy bones, teeth and muscles. Helps with conduction of nerve impulses and muscle contraction. Is used to prevent bone disorders and in hypoparathyroidism and kidney failure.

- Where can you get it? Dairy products, eggs, peas, kippers
- Deficiency signs: Cramps, muscle spasms
- Overdose symptoms: Constipation, nausea

DANGER! Too much calcium in the body can be fatal.

#### Iodine

Essential for the formation of thyroid hormones, needed in growth and metabolism.

- Where can you get it? Seafood, wholemeal bread, dairy products
- Deficiency signs: Goitre [severe]
- Overdose symptoms: Hypothyroidism [severe]

#### Iron

Aids formation of red blood cells and certain proteins. Transports oxygen, removes carbon dioxide. Component of enzymes. Maintains healthy muscles.

- Where can you get it? Eggs, pork, chicken, venison, milk products, leafy green

vegetables.

- Deficiency signs: Anemia, sore tongue, fatigue, loss of appetite, neusea, sensitivity to cold.
- Overdose symptoms: Darker stools, constipation or diarrhoea, nausea, abdominal pain.

DANGER! Can cause fatalities in children.

### Magnesium

Needed for healthy teeth and bones, muscle action, relaxation, energy production and transmission of nerve impulses.

- Where can you get it? Almonds, cashew nuts, brewers yeast, brazil nuts, pecan nuts, cooked garlic, raisins, green peas, crab.
- Deficiency signs: muscle tremors or spasms, muscle weakness, insomnia, nervousness, high blood pressure, irregular heartbeat, constipation, kidney stones, hyperactivity, depression.
- Overdose symptoms: Nausea, vomiting, diarrhoea, dizziness.

### Phosphorus

It combines with calcium to form and maintain strong bones and teeth and building muscle tissue, aids metabolism and homeostasis.

- Where can you get it? Present in almost all foods. High in dairy products, eggs, pork, chicken, venison, wholemeal bread.
- Deficiency signs: Unlikely. General muscle weakness, loss of appetite, rickets and bone pain.

- Overdose symptoms: Diarrhoea, calcium deficiency.

### Zinc

Needed for growth and wound healing. It is used as a topical treatment for some skin disorders. Component of over 200 enzymes in the body, controls hormone messaging, good for bones, teeth and hair, promotes healthy nervous system and reduces anxiety.

- Where can you get it? Oysters, ginger root, lamb, pecan nuts, haddock, green peas, shrimps, turnips, brazil nuts, egg yolk, oats, almonds
- Deficiency signs: poor sense of taste or smell, white marks on fingernails, frequent infections, acne or greasy skin, tendency to depression, low appetite.
- Overdose symptoms: Fever, nausea, vomiting, abdominal pain, headaches.

☐ **Make sure any vitamins/supplements you buy are *chelated* and/or in liquid form. Otherwise you will not be able to digest them.**

### Other Drugs Used in NH (This section for adepts/advanced users only)

**Acetylcholine precursors:** Dimethylaminoethanol (DMAE), lecithin, dimethylglycine, and betaine.

**Fenobam:** a clinically validated nonbenzodiazepine anxiolytic with antidepressant, analgesic and anti-addictive effects, it has dose-limiting side effects such as amnesia and psychotomimetic symptoms. Could be useful for memory adjustment.

**Gamma-decanolactone** is a monoterpene compound, which is shown to be active in some animal models. The psychopharmacological evaluation of this compound in mice has revealed that it has a dose-dependent effect on the central nervous system, including hypnotic, anticonvulsant and hypothermic activities

**Guanosine** and **AIT-082** are examples of purine derivatives, which cause new brain cell growth by mimicking a peripheral effect of brain damage (purines in the cerebrospinal fluid), thus stimulating the brain to heal.

**PT-141:** a selective melanocortin receptor agonist, is a unisex sexual desire, response and orgasm elicitor. PT141 is an odorless, colorless chemical that is administered through a nasal spray about a half-hour before sex, it acts on the central nervous system rather than via vascular dilation and appears to last longer than Viagra. Mild side effects include nausea, headache and nasal congestion.

**SNAP-94847** (developed from SNAP-7941): A selective, non-peptide antagonist at the melanin concentrating hormone receptor MCH. Has been shown to produce both anxiolytic and antidepressant effects, and also reduces food consumption suggesting a possible anorectic effect.

**CX717** (not yet available, but sounds promising) is an Ampakine-type AMPA glutamate subreceptor modulator created by Christopher Marrs and Gary Rogers in 1996. It affects glutamate, with early trials showing the drug improves cognitive functioning and memory, reputedly also has similar effects as modafinil.

**CX-1739**, which is around 3-5x more potent than CX-717 and has better oral bioavailability, is being trialled for treatment of sleep apnea.



The chemical structures of CX-717 and CX-1739 have not yet been revealed. This is very unusual, but may have been kept confidential because the research on CX-717 was initially partially funded by DARPA.

**RG2133** (triacetyluridine). A synthetic uridine pro-drug that is converted to uridine in vivo. Uridine, a pyrimidine nucleotide, has been used in a variety of diseases including depressive disorders, bipolar disorder, and inherited myopathies.

**NPS-1506:** New noncompetitive NMDA receptor antagonists have been developed, including NPS 1506, that appear to be nontoxic.

**NPS-1506** is used clinically for depression and stroke. It is a neuroprotective, which does not have the side effects of PCP type action. It has demonstrated strong effects on improving memory and preventing cell death. If given within a 2-hour window of opportunity it provides neuroprotection against ischemic stroke, traumatic head injury, and hemorrhagic stroke.

**AC-5216:** is an antianxiety/antidepressant drug. Unlike most of the currently available antianxiety agents that belong to the benzodiazepine type, AC-5216 is an agonist for mitochondrial benzodiazepine receptors and promotes the production of neurosteroids, which act on GABA receptors. Pre-clinical study data of AC-5216 demonstrated that even at a low dose it produces anxiolytic-like and antidepressant-like effects. None of the adverse effects that are usually observed with existing benzodiazepine type drugs were observed. Preparations for Phase I clinical trials are currently underway in Japan.

**Primidone** (deoxyphenobarbital)- an uncommon, but unscheduled drug used to control epilepsy. It metabolizes into phenobarbital.

**3-alkyl-substituted-GABA:** should be alcohol/GHB like in effect, if not that at least sedative, eg 3-ethyl-GABA, 3-propyl-GABA. You can make these easily and the precursors are uncontrolled.

**QH-ii 066:** that's diazepam with the chlorine replaced by an ethynyl. Apparently feels like booze.

**GABAmimetic therapeutic compound, gamma-vinyl-GABA:** has advanced to clinical trials in human patients with promising initial open-label results (2009).

**Article: A Good Rant About Drugs** [From: 'I've Changed My Mind' by A.J. Ramonsky –see files]

"I'm often asked my opinion about drug addiction, and whether my techniques could "get people off drugs". My views are based on both my own past experience and that of others, both philosophically and in research.

I find it curious from my current point of view that in our society, distinctions are made between 'drugs', as in illegal or other substances that people get addicted to, 'drugs' that people get from doctors or chemists, and 'drugs' such as sugar, coffee, tobacco, alcohol and junk food. All of these categories of 'drugs' affect the mind, and the behavior, profoundly. Sugar and junk food have as strong a link with delinquent crime as alcohol or amphetamines. The side effects of regular use of Ibuprofen, Valium or Chloramphenicol are just as serious as those of tobacco, and worse than marijuana. (That was a qualifier...)

If someone suffers from depression, and they find a drug which relieves the symptoms, they are going to use it, because from their point of view they feel more responsible, capable and, bluntly, sane when they use the drug than when they do not.

And which is preferable -a nervous, depressed, irritable person driving the family car, or a person under the influence of a drug that makes them feel sane and happy? My point is, I believe that many 'addicts' who choose not to stop are self-medicating to relieve an otherwise unpleasant or unbearable mental state. Many are doing this legally, with Prozac, Valium, alcohol, tobacco or chocolate. They know the substance is damaging their body and creating social problems. But in just the same way that the side-effects of pain-killers are still preferable to acute pain, the social and physical side-effects of addiction seem better than acute psychological torment. I will stick my neck out here and say that I believe any addict who chooses to continue is probably in this position.

When I say “psychological torment” I'm not referring to the effects of withdrawal. I mean the person was in psychological torment before they ever took the drug, and took it in the first place because they were looking for relief from that torment. They probably tried several drugs before finding one that worked. And the symptoms will return, and remain indefinitely, if the drug is stopped. So by asking addicts to stop we could be doing the equivalent of taking away the Prozac from someone with deep depression, or the Chlorpromazine from someone with schizophrenia. There is still social stigma attached to 'mental illness', and many people would rather not tell their doctors that they have a problem. Instead, they'll get drunk, or snort coke, or whatever. Many people don't even know they do have a problem, because there are so many people on drugs that it's become a 'normal' part of subculture.

Which condition are we treating, if we get someone “off drugs”? -The addiction, or the condition which caused it? Should we assume responsibility for our own genetically inherited diseases, our neurological / neurochemical imbalances / disorders, or our viral infections? We don't get sick on purpose. We don't get psychologically distressed or depressed on purpose. Is a drug user guilty for taking medication with bad side effects, if nobody is providing anything better?

Why would anybody who is 100% mentally healthy ever choose to put anything into their bodies or minds if it didn't, overall, make them feel better? How many people are out tonight searching for anything that will? Psychoses and neuroses do not always respond to drugs from a doctor. An individual's mind, and neurochemistry, is unique. Sometimes, chocolate or tobacco or marijuana will do the trick. Should we, then, take this away from them, or make them feel guilty for doing it?

On the physical damage side, cortisol poisoning caused by anxiety increases the possibility of so many diseases / disorders, there is not enough time or room here to list them. It is definitely worse for you physically than smoking anything (and pretty nasty for your loved ones, too).

What we should be doing is assessing why people need drugs (any drugs) and providing the safest drugs possible to relieve the symptoms each person suffers when s/he is 'straight'. This is what doctors try to do, although, with a patient, the illness is already recognized. Perhaps the biggest question should be why such a large percentage of the population suffers from mild-to-middling psychological disorders? There may be a clue to this in those organizations which succeed in 'curing' addicts -perhaps what they are actually doing is curing the underlying disorder, by showing the person that someone cares and giving them a bit of self-esteem, with the love, respect, affection and attention they maybe never got from parents, friends or partners,

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and the lack of which caused the depression in the first place? Human beings need to be nurtured throughout growth to be mentally healthy, to avoid insecurity and fear of abandonment. Insecurity = fear = anxiety = depression in a lot of cases.

How many people do you know who are 100% sane?

Current methods of legal interference in this are obsolete. If any person has to take any kind of medication to relieve any kind of symptoms, and that medication affects their behavior and/or performance, then they should be monitored by their GP and assessed for their ability to drive or operate machinery. They may need to register as disabled until a safer medication can be found or a cure is forthcoming. But without such a cure, expecting anyone to give up their medication and just suffer is perhaps a bit barbaric? The state would, of course, have to trash all the current drug laws and hand the control of substances over to the doctors and scientists. So a heroin manufacturer would have to pay taxes on that, and users would pick their supply up on prescription. Same for tobacco. And I reckon a lot more people would go for therapy / treatment than could be bothered to get their cigarettes on script every month...although if it were thought of as a medication, it would be more popular in tablets -who on earth would smoke it?

That the current situation does not strike humans as peculiar or even out of the ordinary is another testament to our acceptance of damage as the 'norm'. What you should be thinking right about now is "how much of this crap can I stop shoveling into myself and still feel okay?" Because if you start removing what you don't need now, you will find it a lot easier to let go of more as we go along.

I am talking about things you do every day. The things you do once a week or once a month don't worry me; the effects wear off and you're not continuously under the influence. You're not causing tolerance to occur. Tolerance is bad news because it shifts the brain chemistry permanently into an artificially maintained state which backfires violently if the drugs or tech maintaining that state are withdrawn or supply is suddenly irregular. Be aware: you should not stop taking anything if you cannot remain sane and centered enough to learn to function without it. Get real.

One of the most damaging medications if used long-term is sleeping tablets. Drug-induced sleep often lacks enough REM time for us to assimilate and move memories around sufficiently. This slows down learning a lot. We need at least six periods of REM during a normal sleep,

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whether we remember them or not is pretty irrelevant at this stage, but happen they must, or part of our waking time must be spent in assimilation and this prevents alertness and attention. Eventually lack of REM leads to memory problems, and finally neurological disorders. Sleeping tablets, heavy narcotic use and alcohol abuse can all lead to this situation. So, less R&R, more REM.

I keep expecting some mainstream type to announce this soon because there's an awful lot of sleep research going on but so far (March 2004) they don't seem to have figured it out. What we need is a drug that induces sleep but doesn't prevent REM. If you're an insomniac neurohacker, there's a project for you. Personally I don't have any difficulty sleeping apart from resenting having to do so much of it.

Stay real. Giving things up because they are 'bad' for you is sentimental nonsense, and will harm your progress, unless you have got to that stage where your somatic (body) damage is affecting your state of mind. Otherwise, being mentally unstable is far worse for you than the physical side effects of drugs, (especially if you value sanity more than biology.) But as you progress with neurohacking work, you will start to find you will no longer feel a need for many things you originally used for self-medication. You will not so much need to give things up, as allow them to give you up as you pass beyond a need for them. When you get well, you won't need medication.

So be gentle with you. A really good thing to go for as a first try is give up high density, fast-release carbohydrates; they trash both neuro- and body chemistry, cause diabetes and obesity, and contribute vastly to the aging process. If you can live without high-density carbs you will get the effects of calorie restriction without having to do any restricting. Once you get used to it, the increase in vitality is tremendous. Don't try to force yourself to give up things; do it the intelligent way. Provide yourself with something better, i.e., wait for and work on a better more stable state of mind, and you won't want the old crap any more anyway. At first, you'll do it more rarely, eventually not at all.

Also remember, if you are dependent on something to maintain your state of mind, you can always be controlled or thrown out of balance by someone else removing it. Not only that, but your ambient neurochemistry will affect every part of your perception and the weighting of every experience. The simpler to maintain your ambient state is, the easier it is for you, in the long run."

## Drugs & Chemicals Intro - Part 3: Natural Introduced Chemicals

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