The quick and easy guide to...

A Better University Brain

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1 What on Earth are you putting in your body

Fancy raising your academic performance and, while you're at it, boosting your immune system too? Like the idea of improving your concentration and also your general mood? Or increasing the power of your memory and also calming your revision nerves? There is a lot that you can do to enjoy a healthy mind in a healthy body.

But the chances are that you do need some guidance. This is because living on planet Earth used to be much simpler – the air people breathed, the food and drink they consumed, were all pure and free of chemicals. Now all that has changed. Our bodies and our brains are assailed by toxins from all environmental quarters.

A TOXIC PROBLEM

Bio-chemical agents pollute the body more than was ever thought to be survivable. For instance, US figures show that Americans today have over 500 different insecticides and herbicides in their bodies, including levels of the pesticide DDT five times over what was thought to be safe ten years ago. DDT is associated with cognitive dysfunctions such as poor verbal attention and impaired sequencing abilities.

Due to radioactive fallout, there is over ten times more Strontium 90 in the bones of every American than was considered safe ten years ago. A 2003 survey conducted by WWF across the UK, the first of its kind, found the blood of all its 155 volunteers to contain a cocktail of poisons ranging from pesticides to flame retardants and including many highly toxic chemicals that had been banned as far back as the 1970s. Jocasta Shakespeare is a UK journalist who spontaneously had her blood checked for toxicity and discovered the following poisons in her system, some at inexplicably high levels: lindane (a hormone-destroying pesticide used to treat head lice and wood lice), DDT, HCB, pentachlorophenol, PCBs, lead, mercury, cadmium, aluminium.

Environmental toxicity is now becoming a new area of study due to its pervasiveness in today's world and due to the rising number of people now suffering life-threatening allergies and chemical insensitivities – not to mention electromagnetic field sensitivies from computer equipment and mobile phones.

Aggravating the impact of these various environmental toxins, a different onslaught of chemicals awaits young people from early adolescence onwards and forms a constant backdrop to student life. These are addictive substances such as caffeine, cigarettes, alcohol and drugs, including prescription drugs. By and large, these are affordable, available and socially acceptable – in fact it may feel socially unacceptable to reject some. Yet they can cause physical harm and damage your brain. Aside from often causing the very symptoms that they are taken to relieve (mood swings, anxiety, insomnia and so forth), leading to a cycle of psychological and physical dependence on them, caffeine, cigarettes, alcohol and drugs are all neurotoxins, which means that they can kill brain cells.

To make matters worse, the erratic sleeping, eating and lifestyle patterns with which many people respond to study deadlines can be yet another source of emotional and mental dysfunction.

So, either in part or in whole, bio-chemical and lifestyle imbalances may be behind the panic attacks, concentration problems, memory lapses, lack of motivation, lethargy, anxiety, depression, insomnia or mood swings that you may be experiencing. But there is good news. While you can't eliminate pollutants in the atmosphere, still, there is plenty that you can do to protect yourself and give yourself a better brain.

THE VULNERABILITY OF STUDENTS

I have observed students, particularly young students in their early twenties, to be among the most physically and emotionally vulnerable in our society, for the following reasons:

1. Neuroscientists have discovered that the brain continues to mature until its mid-twenties, and the area that develops latest is the prefrontal

cortex. This governs ‘mature’ behaviour: it controls impulsive urges, regulates the emotions, and enables moral reasoning.

2. Because a young adult’s brain is still maturing, any substance that is harmful to the brain may affect normal development. “Since the young brain is in the process of making permanent connections between nerve cells, the presence of any chemical during this period could change that ‘wiring’ in unpredictable ways for the rest of that person’s life.” (Cynthia Kuhn, Scott Swartzwelder and Wilkie Wilson, professors of pharmacology and psychology and Duke University Medical Center in the US and authors of *Just Say Know*).
3. Young people don’t feel the ill-effects of their mistreatment of their bodies as keenly as older people, and so can more easily ignore or overlook warning signals – hangovers, vomiting, dizzy spells and insomnia for instance.
4. Yet a young adult’s body is sensitive to smaller doses of harmful and addictive substances than the body of a fully grown adult.
5. The stressful aspects of student life, combined with the lack of parental support and an intoxicating sense of freedom, attracts many to quick fixes.
6. Young people may be unaware of the hidden dangers of some quick fixes. In a student culture, these are prevalent and there is enormous peer pressure to take them.
7. Away from home, they have no-one to organise their diet or regulate their lifestyle and little experience in looking after their own health.
8. Students on a tight budget often eat cheap, low-quality food.
9. They’re often in a tearing hurry and regularly eat fast food on the run.
10. This means they may slowly but surely be depleting their dietary reserves; yet in times of stress the body needs more support and better nutrition than under normal circumstances.

It's easy to overlook signals indicating that your diet and lifestyle could be the cause of your study problem. For example, let's say that you like to drink Diet Coke, have tea and coffee in your breaks, prefer beer to water, snack on crisps, smoke a little bit of cannabis to relax, party into the night and catch up on work by setting the alarm early or working into the small hours… Everyone else does the same thing around you so that's just normal behaviour as far as you're concerned. Could there be a connection between this 'normal behaviour' and the difficulties you're experiencing in your work?

Yes, because:

- Concentration problems and tiredness – but not thirst – are among the first signs of dehydration.
- Cannabis was 20 to 30 times weaker in the 70s than it is now – a 'spliff' today can contain as much as 260mg of cannabis and yet it takes only 0.7mg of cannabis to produce an observable effect in the brain. (By contrast, it takes 2,000mg of alcohol to produce an observable effect.)
- Alcohol is a depressant.
- Losing two hours sleep a night over five consecutive nights costs fifteen IQ points.
- Depression and anxiety can be caused by drinking too much coffee.
- Crisps contain MSG which can cause mood swings.
- Difficulty with reading and writing, and memory problems, are one of the effects of Aspartame, a chemical present in many 'Diet' drinks.
- Hyperactivity and learning difficulties can be caused or exacerbated by some soft drinks and cola drinks.
- Tiredness and concentration problems can be caused by drinking too much tea, especially for women.

POSITIVE MEASURES

This guide offers you a closer understanding of these connections. It isn't intended to make you feel guilty or ashamed. My aim is to inform you, so that you can see more clearly how to get out of a vicious circle – or avoid getting one in the first place.

For instance, I've worked with students who smoke weed to stop feeling bad about not working. And why aren't they working? For any number of reasons – some are bored or overwhelmed by studying, some are unable to concentrate properly because of a trauma, others need better study skills to get out of a study rut. So their destructive habit arises, in fact, from a healthy instinct to resolve emotional pain. Once this is understood, it's possible to address root causes. Sometimes it helps to have someone else help you do this. Whatever the reason, finding out the source of the problem enables people to become happier, healthier, and study better.

For simplicity's sake the information is divided into two chapters on "What to favour" and "What to avoid". Within these two categories, certain items may not help you or harm you much on their own but have powerful effects in conjunction with other pursuits. So for instance if you smoke, that alone probably isn't the cause of your existing study difficulty. But if you smoke and abuse alcohol and also eat unhealthily, then you could be looking at a combination of factors that's tipping you over the edge. Likewise, it may require a package of positive measures for you to notice significant study benefits.

2 What to avoid

The food and drug industries enjoy close relationships with governments and yield unrivalled lobbying powers. Therefore you will undoubtedly come across sources of information which play down the negative effects of some foods and drugs listed in this guide. However, thousands of personal testimonials warn of the ill-effects of certain chemicals in our food, drink, medicines and grooming products, and these claims are backed up by the research findings of independent scientists. That is why this chapter warns against certain foods and drugs that other sources may tell assure you are safe.

Although some substances such as the food sweetener Asapartame and the recreational drug Ecstasy are thought to produce brain damage however small a quantity you take, many harmful substances produce no measurable ill effects provided that they are not taken to excess – though in certan cases, as with alcohol, it is easy to exceed safe limits without realising it. I have written the pages that follow with an awareness that while I must point out risks, it is impossible, and probaby undesirable, to live a perfectly healthy life – particularly as a student. Where you don't want to practice abstinence, then opt for moderation instead.

ALL ARTIFICIAL CHEMICALS

Many people suffer ill-effects from artificial additives and other chemicals, and therefore it makes sense, especially if you're experiencing study difficulties, to use certain foods and products with extreme caution. While they might not be wholly responsible for your study problem, they could certainly be aggravating your difficulty.

It's impossible to live a modern life free of chemicals. But it makes sense to scour the labels on everything you buy – including beauty and household products. This is because it's not a good idea to put anything on your skin and hair or breathe fumes that you wouldn't eat, as the chemicals in skin and hair

products and household products (even in candles made using artificial ingredients) also end up in your bloodstream. If you notice that you react badly to something, exclude it – allowing 60 days to clear it out of your system.

FOOD ADDITIVES

With respect to the chemicals in food, there are too many additives to list here, but you can find lists of E numbers on the Internet and in books such as Maurice Hanssen and Jill Marsden's *E is for Additives*.

However, in brief, students, with their fondness for processed foods, are particularly high consumers of MSG and Aspartame, and these can be especially damaging, which is why I devote a section to each (see below). But also:

- Two notoriously harmful additives are Amaranth (E123) and Sunset Yellow (E110) which strip the body of zinc and magnesium, causing restlessness and anxiety.
- Many soft drinks and cola drinks contain caramel colouring (E150) which disrupts attention by disturbing neurotransmitter function, and phosphoric acid (E338) which strips the brain of hydrochloric acid, essential in absorbing nutrients such as magnesium and calcium (magnesium deficiency causes learning disabilities and restlessness; and calcium deficiency, anxiety and neurosis).
- Tartrazine (E102) in fizzy orange inhibits the absorption of zinc, causing irritability and mood swings.
- Even sugar, in excess doses (the level of which depends on every individual) can lower immunity and cause hyperactivity, memory and concentration problems.

A word about junk food in general, before honing in on specific culprits. Highly processed foods such as cakes, pastries, biscuits, fried fast foods and battered foods contain trans fatty acids which are implicated in learning difficulties ranging from dyslexia to autism.

Aspartame E951

All the artificial sweeteners on the market are suspect. However, so far, Aspartame (aka Canderel, Nutrasweet, Equal, E951) is the most controversial. Aspartame was once on a Pentagon list of prospective biochemical-warfare weapons, I kid you not! Initially it was banned in America by the Food and Drug Administration, but powerful political lobbying by the food industry gave it its current approved status and Europe has followed America's lead. Many politicians world-wide continue to try and have Aspartame banned but so far it has only been banned by European Union from being used in children's products, despite being implicated in many lawsuits.

It exists in a huge variety of foods, ranging from table-top sweeteners, fizzy drinks, 'health' foods and even in sweetened vitamins and prescription drugs. A full list is given at the end of this section. The product has a long history of causing severe health problems. Along with MSG (monosodium glutamate) and MSG-like food additives, Aspartame is, according to Dr Russell Blaylock, author of "*Excitotoxins, The Taste That Kills* in a class of compounds known as "excitotoxins", which overstimulate brain cells until they die. In other words, each serving of MSG or Aspartame has the potential to cause a small amount of brain damage, which becomes cumulative and is thought to provoke Alzheimer's Disease, Parkinson's, or other neurological diseases.

Aspartame is especially controversial, as laboratory tests before it was approved showed that it caused brain lesions, cancer, death, and a number of other serious health problems. Since its approval, brain cancer rates have risen, although a portion of those cases may be due to the explosion of cell phone usage at around the same time. Aspartame is the food additive for which the FDA receives 75% of complaints about adverse reactions, with a range of known adverse effects including seizures, birth defects, cancer, and death.

Aspartame is thought to trigger or mimic the following conditions:

- M.E.

- Multiple Sclerosis
- Epstein-Barr Syndrome
- Non-Hodgkin's Lymphoma
- Hypothyroidism
- Post-Polio Syndrome
- Alzheimer's Disease
- Fibromyalgia
- Lyme Disease
- Hyperactivity
- Meniere's Disease
- Grave's Disease
- Mercury sensitivity from amalgam fillings
- Epilepsy
- Amyotrophic Lateral Sclerosis (ALS) (Lou Gehrig's Disease)
- Systemic Lupus
- Erythematosis (SLE)

Shorter-term reactions include:

- Headaches
- Migraines
- Dizziness
- Joint Pain
- Nausea
- Numbness
- Muscle spasms
- Weight gain

- Rashes
- Depression
- Fatigue
- Irritability and mood swings
- Tachycardia
- Insomnia
- Vision Loss
- Hearing Loss
- Heart palpitations
- Breathing difficulties
- Anxiety attacks
- Slurred Speech
- Loss of taste
- Tinnitus
- Vertigo
- Memory loss

What are the particular cognitive implications for students? Dr Roberts, author of *Apartame Disease: An Ignored Epidemic* warns: "I have observed severe intellectual deterioration associated with the use of aspartame products. It was usually manifest as great difficulty in reading and writing, obvious problems with memory and grossly impaired orientation to time, place and person."

These effects, along with similar nerve and brain damage caused by other excitotoxins such as MSG, are held responsible by Dr Roberts for a global epidemic of premature ageing among the young: "It may take a generation or longer to ascertain the full extent of this problem."

Why is Aspartame so poisonous? Aspartame is made of 3 components, 50% phenylalanine, 40% aspartic acid and 10% methanol (wood alcohol). It is not safe to consume more than 7.8mg of methanol per day. If you drink three cans of an Aspartame-sweetened beverage in one day, your intake of methanol is about 56 mg, 7 times over the recommended daily limit. Heavy users of Aspartame-containing products consume as much as 250mg of methanol daily, 32 times over the recommended limit.

Methanol is a cumulative, human-specific, metabolic toxin. Your body doesn't have the necessary enzymes to detoxify from it. Natural foods containing methanol also contain ethanol: the latter protects you from the harmful effects of the former. But this protection is absent with Aspartame.

So your body does its best and breaks the methanol down into formaldehyde and formic acid (and also into two amino acids, aspartic acid and phenylalanine). Formic acid is the poison in ant stings. Formaldehyde, if you remember from those jars of dead lizards in your biology lab at school, is an embalming fluid. This is why Aspartame is detrimental to your central nervous system and indeed every organ of your body, your brain included.

To avoid it you must learn to interpret product labels, as there are over 9000 products world-wide containing this sweetener, and the list is growing: a product labelled as containing 'no added sugar' or 'sugar free' will have been artificially sweetened, and is likely to contain Aspartame. Only if a product is labelled 'unsweetened' can you be fairly confident that it contains no sugar or sweeteners.

The following is a short list of some products that often contain Aspartame:

- Lemonade
- Squash
- 'Diet' drinks and foods
- Diabetic foods
- Yoghurt

- Breakfast cereal
- Jams and preserves
- Cakes
- Jams
- Sweets
- Chewing gum
- Ice cream
- Toothpaste
- Mouthwash
- Lip balm
- Biscuits
- Medications
- Supplements
- Some bottled waters

In short, if through the day you're drinking a couple of Diet drinks, chewing a few sugar-free gums, eating Aspartame-sweetened yoghurts, putting Canderel in your tea, drinking Alka-Seltzer for your headache, or using a standard toothpaste from your local chemist store, you can probably blame the food industry for your recurring panic attacks and concentration problems.

MSG E621

Monosodium glutamate, or MSG, is a form of the amino acid glutamate. Glutamate exists naturally in our bodies and in protein-containing foods, such as mother's milk, cheese (especially parmesan), milk, meat, peas, and mushrooms. MSG in this form usually causes usually no adverse reaction. Cooking (causing hydrolisation), ripening and fermentation of food also produces some naturally occurring glutamate and again, this usually causes no problem – for instance, Asians originally used a seaweed broth to obtain

the flavour-enhancing effects of glutamate and apparently suffered no ill effects – although there people with little tolerance for glutamate who do become ill from soups and stews that they have prepared from natural ingredients. However, the amounts produced in this way appears to be low enough to be tolerated by the vast majority.

This is why there is some confusion about the ill effects of MSG. It is also confusing that people famously suffer adverse effects from MSG in Chinese food but not in Japanese food, which also contains MSG (present in soy sauce, for instance). One reason for this discrepancy may be to do with the high taurine content of certain foods prevalent in raw or lightly cooked Japanese dishes – such as in the raw fish and raw ginger common in sushi meals. Taurine is an amino acid that helps to detoxify, but it is destroyed by high stir-fry temperatures associated with Chinese cuisine.

Certainly, the higher the quantity of glutamate, the less the body can deal with it. And the industrial, salt-stabilised form of MSG (the monosodium part) produced by the food industry since the 1950s, appears to trigger many adverse reactions. This form of glutamate is a fine white crystal substance, similar in appearance to salt or sugar, used as a flavour enhancer. It is sold in Asian supermarkets. Some restaurants – particularly Chinese restaurants – season their food with it as you would season your food with salt and pepper.

MSG whets the appetite and is added to low quality or old food because it deceives your taste buds into thinking the food is much more delicious and fresher than it really is. Scientists don't really know how it does all this, but it masks bitterness, 'off' flavours, sourness, and the tinny taste of canned foods – so you can imagine how much the food industry relies on it and how much it is unwittingly consumed by students, with their often daily reliance on cheap, tinned and prepared foods, crisps and take-aways.

What's so powerful about MSG? Its ability, which it shares with drugs like cannabis and crack, to penetrate the brain barrier and directly affect the function of the brain. Unlike most other foods, MSG causes the brain to

change how it controls the rest of the body. This can disrupt physical function, for instance by causing the typical ‘MSG headache’ or diarrhoea within twenty minutes. Commonly reported reactions to MSG include:

- Headache, sometimes called MSG headache
- Flushing
- Diarrhoea
- Sweating
- Sense of facial pressure or tightness
- Numbness, tingling or burning in or around the mouth
- Rapid, fluttering heartbeats (heart palpitations)
- Chest pain
- Shortness of breath
- Nausea
- Weakness
- Blood pressure spikes

Not only do MSG symptoms vary from individual to individual, the severity of reactions to MSG seems to vary, sometimes in the extreme. Some people react violently to the smallest amount added to their food. The effects of MSG are cumulative: it builds up in your system over the day, so a little MSG in your Marmite at breakfast may not affect you. (The jury is still out as to whether the type of glutamate in Marmite is harmful). However, more MSG in your salami and mayonnaise at lunch, then more in your crisps at tea-time, then more in your Pot Noodle snack and Thai takeaway supper, may trigger a bad reaction… one which you might not attribute to MSG as it may take up to two days to manifest. The key to deciding if problems are due to MSG is if you respond with the same reaction(s), and after the same elapsed time, each time you eat MSG in excess of your tolerance level.

As mentioned earlier, MSG is in a class of compounds known as "excitotoxins" which excite brain cells until they die. In other words, each serving has the potential to cause a small amount of brain damage, which becomes

cumulative. Long term, MSG is suspected of causing brain lesions and damaging nerve cells and of being responsible for some serious neurological diseases such as Alzheimer's and Parkinson's. And various studies on small mammals, which I don't want to quote directly because I don't like to promote animal research, show a link between MSG and memory difficulties.

If you want to avoid MSG, avoid eating out as most meals served in most restaurants use MSG-laden ingredients. If you eat in a Chinese restaurant, you can request that no MSG be added to your dishes (you'll notice the taste difference!). Steer clear of manufactured, processed, and fermented foods. Replace them with natural, unprocessed, unfermented foods whenever possible. The following convenience foods can contain high amounts of MSG:

- Delicatessen and smoked meat products
- Sausages and luncheon meats
- Tinned foods
- Ready-made stock, chilli sauce, stews and other sauces
- Mayonnaise, ketchup, mustard and ready-made salad dressings
- Processed or dried foods such as instant noodles and soups
- Seasoning mixtures
- Frozen foods
- Teas
- Diet foods
- Crisps
- Desserts
- Ice cream
- Dairy products
- Cakes

- Chewing gums
- Medications
- Supplements

MSG comes in many disguises:

- E621
- Hydrolysed (vegetable) protein (any protein that is hydrolysed)
- Textured protein
- Glutamate
- Monopotassium glutamate
- Glutamic acid
- Calcium and sodium caseinate
- Yeast extract and yeast food
- Autolyzed yeast
- Hydrolised yeast
- Yeast nutrient
- Gelatin
- Accent and Zest
- Glutavene
- Glutacyl
- RL-50

Also, these products and additives often contain MSG, or it is created during their processing or manufacture:

- Malt extract and flavouring
- Barley malt
- Tamari

- Natural flavour(s) and natural flavouring(s)
- Bouillon
- Soy sauce and extract
- Soy protein isolate and concentrate
- Seasonings (the word seasoning)
- Broth and Stock
- Whey protein isolate, and concentrate
- Milk solids in low fat milk products
- Spices (sometimes)
- Protease enzymes and enzymes (depending upon the source)
- Mei-Jing and Wei-Jing
- Ajinomoto
- Anything protein fortified, enzyme fortified, ultra-pasteurised, or fermented
- Carrageenan
- Maltodextrin
- Kombu extract
- Subu
- Worcestershire sauce
- Pectin

In addition, two food additives, disodium inosinate and disodium guanylate, indicate the likely presence of MSG in a product. Suspect anything containing ‘hydrolised’ ingredients or ‘amino acids’ and beware of labels declaring "No MSG" or "No Added MSG" : if the food contains ingredients that are sources of free glutamate, such as hydrolysed protein or hydrolysed soy protein, then these also indicate the likely presence of MSG.

CAFFEINE

Caffeine is a psychostimulant present in coffee, tea, cocoa products, soft drinks, energy drinks, and of course, in caffeine pills. A strong cup of coffee can contain up to 175mg of caffeine. A cup of tea contains 60mg of caffeine. Fizzy drinks and colas range from 60-150mg of caffeine per can. A 40g bar of dark chocolate averages 30mg. An energy drink: upwards of 300mg.

You can overdose on caffeine. 2g (2000mg) of caffeine can make you ill enough to require hospitalisation: that's about 10 extra-strength caffeine pills.

In moderation, caffeine may give your memory a bit of a short-term boost. Excess coffee consumption however produces anxiety and sleep disorders.

And drinking more than a cup or two of coffee a day does your brain more harm than good: a 1981 study of college students, by US researchers Gilliland and Andress, found that moderate to high coffee consumers suffered significantly higher levels of anxiety and depression than low consumers and abstainers. High coffee consumers showed relatively high levels of psychophysiological disorders and relatively low academic performance.

Long term use of coffee has the following effects:

- Raised cholesterol levels, from as little as two daily cups.
- Damage to the lining of the stomach (and consequent susceptibility to stress-induced ulcers).
- Inhibited intake of nutrients, particularly calcium – a vital element in promoting calm.
- A suspected link to cancer and other serious diseases.

NICOTINE

Nicotine is a poison of which eight drops will kill a horse! So although smoking gives the illusion of well-being, a stress response is in fact triggered when a smoker lights up. Adrenaline is released, blood sugar levels rise, and the pulse

quickens. A smoker's heart beats 10,000 times more per day than that of a non-smoker.

Smoking weakens cognitive processes because the carbon monoxide gas that is inhaled by smokers starves the brain of oxygen. Memory tests show that non-smokers out-perform smokers.

Because smoking introduces 300 chemicals (of which 40 are poisonous) into the body, it impairs immune system function. The result is a range of ailments too enormous to list here, but including anything from weakened resistance to infection, premature ageing, hair loss, gum disease, impotence, and the three well-known killers – cancer, lethal bronchitis and coronary heart disease.

ALCOHOL

Alcohol is usually regarded as a food because in small enough quantities it usually produces no detectable symptoms (although it is thought that there may be no safe limit for an unborn baby exposed to alcohol). It is considered harmless even in excess: drunkenness is socially acceptable in our society. Few people realise that excess alcohol intake has detrimental effects particularly on the brains of young adults.

The problem with alcohol is that it doesn't take much to produce excess. Its ability to penetrate blood cells and thus invade all bodily fluids and tissues, impairing thought, problem solving, learning memory and coordination – all within ten minutes of being drunk – makes it a potent drug. Alcohol can only be broken down by one enzyme in the body, alcohol dehydrogenase, an enzyme which we possess in small quantities to process the comparatively minute amounts of alcohol that arise from digesting food. Even working at full speed, the liver only clears about 7 grammes of alcohol per hour. On this basis, the effects of a pint of beer take two hours to wear off. But this calculation is based on mature adults who have a greater capacity to handle alcohol. In young people, one beer is enough to show up on a breathalyser test.

Alcohol kills brain cells in a dose-related way (the more you take of it, the more brain cells you put at risk). The authors of *Just Say Know* (mentioned in

Chapter 1) describe the consequences of this on young people aged between 18 and 24:

- Regular binge drinking (five beers or five glasses of wine) has been found to shrink the hippocampus, one of the brain's major memory centres, by ten per cent. It's not yet known whether the brain ever recovers from this set-back.
- Those who binge on alcohol on a regular basis have poorer intellectual skills: in neuropsychological tests they perform less well in vocabulary and memory tests.
- Statistics suggest that they perform less well in employment, education and are less able to take financial responsibility for themselves or family members.

For the purposes of every pub-crawling student, it's worth reproducing here the usual safety recommendations:

- Men should drink no more than 21 units of alcohol per week (and no more than four units in any one day).
- Women should drink no more than 14 units of alcohol per week (and no more than three units in any one day).

Note that three pints of beer, three times per week, is *at least* 18-20 units per week. That is nearly the upper weekly safe limit for a man. However, each drinking session of three pints is *at least* six units, which is more than the safe limit advised for any one day. Likewise, a 750ml bottle of 12% wine contains nine units. If you drink two bottles of 12% wine over a week, that is 18 units and exceeds the upper safety limit for a woman.

The more you drink above these limits, the greater the risk of becoming addicted and developing a host of serious problems ranging from obesity and sexual dysfunction to liver disease. The greater also the risk of accidents. As little as one drink a day has been shown to increase the risk of breast cancer

in women by nine per cent. The figure soars to 41% for women who consume five drinks a day.

Even short-term alcohol excess is harmful. It may disturb your academic performance by causing:

- Disruption of the central nervous system, compromising memory, thinking capacity and muscular coordination
- Dehydration and related effects (see my earlier section on 'Water')
- Lethargy from excess acid in the gut
- Mood swings – initially alcohol relaxes people but it also rouses anger and causes depression and anxiety.

Many people at risk of alcoholism don't notice their growing dependence on the bottle. If you're relying on drink to get you through the day or the week, you could be getting addicted. The World Health Service Organisation has a useful self-test reproduced on http://www.aa-uk.org.uk/publications/areyou.htm and you can also get a sense of whether you are at risk by describing your drinking pattern to Alcoholics Anonymous at help@alcoholics-anonymous.org.uk. In addition, these general statistics offer a very rough guide:

- You are at risk of becoming dependent if alcoholism runs in your family. If your parent(s) or grandparent(s) have a drink problem, your chances of inheriting this addiction are 40% and 25% respectively.
- If you started drinking regularly before the age of 16, you now have a 40% chance of becoming addicted in adulthood.

RECREATIONAL DRUGS

In student settings, drugs are easily available and nowadays much cheaper than they used to be. Students are often drawn to taking recreational drugs as an easy way to switch off their minds. However, the sought-after 'high' produced by all drugs is followed by a 'low', a physical and mental depletion that makes the sufferer crave more of the drug to feel better again. The 'high'

burns up energy very quickly and puts strain on all the internal organs – after which the body crashes. The greater the kick produced by the drug, the worse the subsequent crash.

There are too many drugs to list in this guide, but if you do take them, bear in mind that just because everyone else seems to be doing it without apparent ill effect doesn't mean that your own system can cope with it. Cocaine, for instance, is described by some medical experts as a chemical Russian Roulette – some people's hearts fail on it, however healthy and fit they may be. Home Office pathologist Dr Rick James has pointed out that cocaine-induced cardiac arrests are now the commonest cause of heart attacks in young people in the UK.

It's also worth mentioning the increased risk of mistakes and trickery when taking drugs. Can you ever fully trust a drug dealer? A young and terribly gifted student of mine died a violent death when the white powder that he had been assured was cocaine turned out to be heroin. I have a friend who would have suffered the same fate had he not checked, in a sober moment, what he was about to snort.

Regular use of drugs, particularly stimulants or 'uppers' (amphetamines, Ecstasy, crack and cocaine etc) strains the immune system, heart, liver and kidneys, and inhibits normal functions such as appetite and sleep. But even 'downers' like cannabis take their toll. I shall focus on two of the drugs most easily available to students and also considered to be fairly harmless: cannabis and Ecstasy.

Cannabis

I've already mentioned that cannabis is far more powerful these days than ever and that it causes changes in the brain. Yet it is perceived as a harmless drug. It has indeed few short-term effects, other than to dull the mind and produce a feeling of relaxation. However, the active ingredient in cannabis, tetrahydrocannabis (THC), takes so long to be eliminated from the body that its mind-dulling effects can persist for up to a month.

The persistent effects of THC and its by-products affect your ability to learn and remember. Five studies ranging from 1974 to 1991, collated by NHS healthcare journal Bandolier, tested pilots using flight simulators and found that their cognitive function for learning and memory – and also for motor skills – was impaired for at least 24 hours following a modest use of cannabis.

This impairment is not noticeable to the user.

Some people find that when they stop using cannabis they suffer withdrawal symptoms such sleep problems, irritability, anxiety and depression. Other people can use cannabis occasionally without obvious adverse effects.

Long term cannabis users suffer cognitive deficits related to the number of years of use. Other specific long term effects include:

- Learning, memory and attention difficulties.
- Lethargy and apathy.
- Anxiety from calcium depletion.
- Paranoia.
- Irreversible changes in the brain after three years – changes greater than those produced by three years' alcohol abuse (according to research cited by Professor Hardin Jones in his book *Sensual Drugs*).
- Lung damage visible on MRI scans after one year of daily use.

Ecstasy

Ecstasy is also perceived as safe – 'safer than peanuts' – because of a backlash against all the media hype of Ecstasy deaths. Actually, the real danger posed by Ecstasy lies in the drug's instant and irreversible effects on the brain. Again, I don't wish to cite some horrific animal studies which confirm this. Suffice it to say that a 1999 US study at the Johns Hopkins University found that a monthly 400mg of Ecstasy – 4 tablets – impairs verbal and visual recall, and that memory impairment increases with the amount taken and lasts at least two weeks after stopping use. Other little-known effects include:

- Damage to higher mental functions: complex tasks can't be carried out swiftly.
- Irreversible damage to serotonin axons and receptors (serotonin is a feel-good chemical) and this damage inhibits the brain's integration of information and emotion.
- Depression: people who take Ecstasy on a Saturday night are measurably more depressed by midweek; some clinically so.
- Anger.
- Impulsivity.

Long term effects are thought to include, at best, a impaired ability to handle stress, and at worst, brain disease such as Parkinson's disease. A 2002 study of young Ecstasy users at the University of Adelaide in Australia predicts that the drug is likely to cause permanent brain damage in middle age, with resulting memory loss and psychological problems, even after Ecstasy use has stopped.

SLEEPING PILLS AND TRANQUILLISERS

Anyone suffering from anxiety and insomnia should know that, although they are often prescribed liberally, sleeping pills and tranquillisers are among the most addictive prescription drugs you can get – used for more than a week, they start to become a difficult habit to kick. Most belong to the family of benzodiazepines (the same family as Valium, also known as diazepam). These artificially override the natural chemical activity in the brain, inhibiting normal communication between nerve cells. The brain's central nervous system temporarily ceases to produce its own tranquillisers under the influence of these drugs.

Despite being remarkably powerful, they don't replicate real sleep patterns and so don't give you the rested feeling you crave. Instead they induce a state of sluggishness that makes it difficult to sleep the following night, producing the exact problems which they are taken to relieve within two weeks, such as

disturbed sleep, insomnia, exhaustion, panic attacks, listlessness and concentration problems, not to mention a range of physical disturbances such as trembling, aches and pains, sweating, sickness and diarrhoea.

If you take sleeping pills I recommend that you look up a US study on the subject of insomnia and sleeping pills, carried out in 1979 by Chicago University. It is available on the Internet, through the National Academies Press (http://books.nap.edu/openbook.php?record_id=9934&page=81). This study found that half of insomniacs sleep quite well without realising it, waking up adamant that they haven't slept a wink. Volunteers were given a placebo one night and a sleeping pill the next. They slept both nights, but after the placebo night insisted that they had been awake; whereas the morning after the sleeping pill they were aware of having slept. So sleeping pills may not make you sleep more than you already do, but may give you that impression.

There are other measures which promote good sleep, such as the diet and lifestyle habits that it's worth 'favouring'. Time off is also key. I have met students on sleeping pills who swear that they can't possibly take a break from their work, when I can see that this is what they most desperately need. With regular breaks and time off, they sleep better and work better. My *Quick and Easy Guide to How to Stop Panicking and Start Learning at School and University* explains how you too can achieve this.

PSYCHIATRIC DRUGS

Psychiatric medications prescribed for stressed students such as anti-depressants, stimulants, anti-psychotics and anti-hypertensives, deplete the body in similar ways as recreational drugs. Methylphenidate, for instance, the famous Ritalin so often prescribed to hyperactive people, started its illustrious career as a street drug, with properties so similar to cocaine (when powdered) that it continues to be traded on the black market. And, like cocaine, it is responsible for many cases of heart failure.

Dr John D. Griffith, Assistant Professor of Psychiatry at the Vanderbilt University School of Medicine, testified in 1970 to the US Congress: "I would

like to point out that every drug, however innocuous, has some degree of toxicity." The fact that your doctor has total confidence in a drug doesn't mean that it is safe. For instance, the U.S. Center for Disease Control in Atlanta found the leading cause of death in America in 2002 to be properly prescribed prescription medications!

Griffith warned: "A drug, therefore, is a type of poison and its poisonous qualities must be carefully weighed against its therapeutic usefulness."

Yet this careful weighing is virtually never carried out in psychiatry today. There's just too much profit at stake. For instance, Shire Pharmaceuticals, one of the lesser-known pharmaceutical giants, focuses on making pills for so-called Attention Deficit Hyperactivity Disorder (ADHD). This FTSE 100 is valued at around £5 billion. Psychiatry is one of the most profitable businesses on earth.

The 'ADHD' fraud is worth detailing here as illustrates perfectly the deliberate lack of scientific scrutiny behind so many psychiatric treatments. There's no doubt that we are becoming increasingly hyperactive. But is it a brain disorder or something in the water? ADHD has never been found in the brain or blood. No test can detect it. Pro-Ritalin psychiatrists talk of MRI scans and poor blood flow to frontal lobes. But as independent experts like Richard DeGrandpre (author of *Ritalin Nation*) and psychiatrist Beter Breggin (author of *Talking Back to Ritalin* and founder of the ICSPP, International Center for the Study of Psychiatry and Psychology) have pointed out many times over, read the small print: such brain differences are spread randomly between the 'ADHD' subjects and the healthy control groups. The differences are therefore meaningless. But they certainly aren't without effect: they lead to newspaper headlines trumpeting the discovery of ADHD in the brain.

You might think this a bit Machiavellian. But there is worse. Between 1990 and 1998 fourteen studies scanned children who had been on Ritalin for two years or more. These scans showed that parts of their brain had atrophied, suggesting, fourteen times over, that Ritalin shrinks the brain. (Animal studies

also show Ritalin to cause brain shrinkage.) But instead, the damage to the brains of these children was proclaimed to be evidence of ADHD. The fact that only medicated children had taken part in the studies was again banished to the small print.

Was this a one-off (or fourteen-off) scandal? No. In the early 1990s, the UK wasn't yet fully buying the 'ADHD' line: in 1991 only 2,000 prescriptions were being written for Ritalin in the UK. But all that was to change with the release in the late 1990s of the "Multimodal Treatment Study of Children with ADHD" (MTA), funded by the US National Institute of Mental Health, a body itself funded by pharmaceuticals. The MTA was preceeded by the most enormous fanfare. One prominent psychiatrist, Professor of Psychiatry Peter Jensen, heralded it as the biggest and best survey of hyperactive children "on Planet Earth". The MTA was certainly intended to conquer Planet Earth. For all its size, this deeply methodologically skewed study failed to fulfil basic scientific requirements: it was not a double-blind clinical trial, so participants making assessments knew who was on stimulants and who was not; and the non-drug interventions that it tested were irregularly delivered and totally outmoded. Unsurprisingly, the MTA pronounced medication to be the best answer to hyperactivity.

By its sheer size, the MTA eclipsed all studies and testimonies world-wide warning that stimulants produce no long-term health or academic benefits, that they cause sleep problems, cause permanent ticks, brain damage, heart problems and that children on Ritalin have crawled onto their parents' laps and died. And the MTA conquered the UK, with the result that in the UK today the stimulant prescription rate is now about 370,000 every year (185 times what it was 17 years ago). How? In 2000, NICE, the National Institutes of Clinical Excellence, produced the MTA as the basis for its decision to give Ritalin the official seal of approval. This decision gave NHS doctors *carte blanche* to prescribe stimulants to all over-sixes presumed to have this 'genetic disorder'. Suddenly everyone stopped questioning how a gene could wield genetically impossible powers, producing contradictory symptoms that make some people

dreamy yet others hyperactive; and multiplying among the population at a rate only seen in viruses, bacteria and psychiatric fads.

One of the authors of the MTA, Professor William Pelham now confesses: “I think that we exaggerated the beneficial impact of medication… There’s no indication that medication’s better than nothing in the long run.” His words are carefully picked: there’s plenty of evidence that ‘nothing’ is better than Ritalin.

But Pelham’s confession will not put the cat back in the bag. Hyperactivity has been implanted in people’s minds as a brain disease: what was once reported by the mainstream media as “so-called ‘AD(H)D’”, in apologetic inverted commas and brackets, is now ADHD fair and square.

There are not enough systems of scrutiny in place to prevent such aberrations in the psychiatric healthcare industry. Pharmaceuticals can out-lobby independent bodies and fund giant studies. They can bribe or threaten scientists by conferring or withdrawing favours. They can buy the confidence and trust of medics (in the US, an average $10,000, the equivalent of £5,000 is spent on marketing *for each* US doctor). How many studies do you think back up the effectiveness of anti-depressants as a course of treatment for depressed adolescents? Zero. How many UK children and adolescents are currently on antidepressants? 40,000.

Many people, even those whom we pay to know better, now believe drug companies to have cracked the code of mental illness and to understand how conditions like depression, anxiety, hyperactivity and so on affect the brain. Often these so-called illnesses are normal patterns of life: most cases of depression resolve themselves if they are not treated with medication!

Imagine that you are a marketing executive for ‘Big Pharma’. Your remit is product placement. You’re constantly on the look-out for new markets for pills. Students might be one easy market. They’re vulnerable. Some of them are deeply stressed. Your best bet is to suggest that their stress symptoms are brain diseases at root, for which you have the perfect pill – (preferably one with the letters X, Y or Z in its name as that has been found to inspire greatest

confidence). Hence the medical hijacking of behavioural problems, not just as we've seen in the case of 'ADHD', but across the entire range of emotional disturbances. Anxiety is 'Generalised Anxiety Disorder', panic is 'Panic Disorder', shyness is 'Social Anxiety Disorder', PMT is 'Premenstrual Dysphoric Disorder'; depression is 'Clinical Depression'. Yet, as Baughman reminds us: "If no gross (mass, lump), microscopic, (Pap smear, biopsy), or chemical abnormality (PKU, diabetes) can be found, it cannot be said that a disease is present."

Why are people so willing, then, to buy the disease model? I believe one reason to be a desire to abscond responsibility to a pill. Rejecting the proposed model of chemical imbalance means seeking out the true cause of the problem. That's too much of an effort, too expensive for governments and too bothersome for professionals and the individuals concerned. It's easier to believe that the answer lies in something you can pop in your mouth – or your child's mouth – with a little water. With such an easy answer at hand, who cares if it's a brain disorder or not?

Yet there are no real pills for ills: no pill restores healthy function because no scientist fully understands how the brain functions, let alone how to fine-tune its complex chemical make-up using a crude cocktail of artificial laboratory ingredients.

Psychiatric drugs act by overwhelming the brain, not by correcting so-called deficiencies. Ritalin is a case in point: it has an effect on everyone, not just on hyperactive people, and indeed some body-builders, journalists and students take it as they would take a caffeine pill, because it helps them to perform repetitive tasks in a very 'focused' (blinkered) way. Cocaine in pill form would produce the same effect. Likewise, the demarcation between the effects of sleeping pills that make you 'sleepy' and tranquillisers that make you 'calm' is very woolly: often they are used interchangeably since they both make you drowsy: beyond that, their effects are a matter of subjective interpretation. Psychiatric drugs are more market-specific than target-specific. (You may

recall that Viagra started its life as high blood pressure pill before its aphrodisiac properties were stumbled upon.)

Lawyer Mark Harvey at the Cardiff firm of Hugh James Ford Simey, has conducted many class action medical negligence cases against drug companies, and comments: “The drugs are all trying to fill that huge gap in the market - covering anything from mild to serious depression - and if you can produce something that alleviates the problems and isn’t addictive, then you have a huge winner.” Luckily for the drug companies, addictiveness is also a subjective issue.

So the real guinea pigs are not the laboratory animals on whom the drugs are tested for a few months, but the humans who take it and suffer adverse and addictive effects, many of which we are yet to discover.

In many instances, it is the patients who are blamed for the pill’s effects. Selective Serotonin Reuptake Inhibitors (SSRIs), such as fluoxetine (Prozac) or paroxetine (Seroxat) are known to cause sudden suicidal or murderous impulses, but these are easily attributable to someone suffering from depression. So who cares if the pill does the opposite of what it’s supposed to do, as long as the victims can be silenced or discredited?

By another linguistic sleight of hand, a drug’s unwanted effects are termed ‘side effects’, reinforcing the notion that a drug’s main effect is to cure your problem. In fact the drug has many effects, one which is to mask your problem, and others which may cause you different problems… for which more drugs, with more ‘side effects’, may be prescribed. In this way many people who previously enjoyed good health despite their emotional problems have become suddenly physically wrecked, sometimes for life.

As investigations by psychiatrists such as Dr David Healy into Seroxat and Prozac have revealed, drug companies may be well aware, from their own trials, that a new drug is damaging, and bury all evidence. Doctors who dare to challenge their safety claims risk being ostracized from the medical establishment. Meanwhile, literature and studies supporting these drugs

continues to be released, a smokescreen for the hit and miss nature of psychiatric drug production.

The majority of medical professionals are seduced by the subtle and even unsubtle marketing strategies employed by drug companies – not just the studies but also the paid trips abroad, the free dinners and lunches, the gifts, the free pens placing their products. Doctors and psychiatrists can be as weak-willed as your next man. Indeed, 80% of psychiatrists are thought to self-medicate. I go back to my earlier question: can you ever fully trust a drug dealer?

If you find my question shocking, consider this. A psychiatrist from a prestigious psychiatric unit admitted to me that despite being startled when he observed the harmful effects of the Ritalin he was prescribing to a child, who started behaving obsessively, *he continued to prescribe it out of a compulsion to follow the psychiatric fashion*.

Very few psychiatrists think before they prescribe. The majority believe the pseudoscience, sometimes fervently. Few read the small print. Few bother to find out root causes, in spite of the huge body of evidence that diet, lifestyle and psychological factors underpin behaviour, performance and mood.

But there is worse. The laziest psychiatrists also use pills diagnostically: if the pill appears to work, it proves, they say, that you've got the associated brain disease. On this basis, anybody can be proved to have a brain disease. First, the efficacy of a drug is a very subjective issue – going back to Ritalin and its famous 'zombie' effect, someone may appear 'calm' and restored to balance who is actually just drugged. Remove the drug, and the problem reappears, usually with a host of additional withdrawal symptoms. Second, efficacy doesn't prove the existence of a biochemical imbalance at source. After all, aspirin relieves headaches: yet no one believes headaches to be caused by aspirin deficiency.

Whether you medicate or not, your problem won't go away unless something else changes in your life. So, either way, it's worth investigating possible causes. Check out all dietary, lifestyle and psychological factors, asking yourself, 'When did I first start feeling like this?' and then going as back as your early childhood if necessary. Then address these in the most appropriate way you see fit. You may need someone to help you do this.

EFT is a drug-free, cheap and effective way to heal an extraordinary number of ailments – depression, anxiety and hyperactivity included. It is described more fully in Chapter 2 ('A Good Outlet'). For full details of EFT and some extremely helpful DVDs on its many applications, visit www.emofree.com. You can also download my *Quick and Easy Guide to Boosting Your Studies and Your Morale with EFT* from my website.

Note that anyone wanting to come off medication must be weaned very slowly in order to avoid withdrawal symptoms. Consult a doctor or specialist support group for information if you wish to reduce your dose.

3 What to favour

The list of healthy things you can do is endless. For the purposes of this guide I shall pass on a few general guidelines to keep your body, mind and soul as safe as possible especially in times of stress. I avoid recommending brain-boosting supplements as these are best prescribed by a health specialist.

5 HELPINGS

Nutritional depletion causes concentration problems, memory problems and mood swings. Yet it can be hard to organise a good diet when faced with the pressures of student life. Good nutrition costs time, effort and expense in the short run, but as it protects you from getting ill, overall, the payback is better health and a better brain, saving time, effort and expense in the long run.

Some students live on take-aways and other fast food. Others spend their time on a weight loss plan (which I don't recommend when undergoing the added pressures of exams, by the way, since restricting food intake interferes with your concentration and mental performance and makes you irritable). Some try to eat healthily and ethically but may do this in a haphazard, disorganised way – many vegetarian and vegan students, for instance, just cut out animal produce, without knowing what to replace it with. (If so, you can get specific nutritional advice from professional sources such as the Vegetarian Society). All these and other unhealthy eating habits can cause nutritional deficits.

In general terms, the following guidelines can help you stay well nourished :

- Eat five portions a day of fruit and/or vegetables. These are a rich source of many vitamins and other antioxidants and protect your brain from the ravages of ageing and damage by free radicals.
- Eat whole foods. White bread, white rice, white pasta and other processed grains are nutritionally not a patch on their wholemeal, whole-grain and whole-wheat cousins.

- Eat organic. Organic produce is usually nutritionally far superior because it is grown in soil that is naturally abundant in nutrients. The difference is often obvious in the taste. Organic produce is also comparatively free of pesticides and herbicides. Non-organic fruit and vegetables may contain up to a dozen chemicals. Non-organic chocolate contains lindane, the toxic pesticide mentioned in Chapter 1.
- Avoid non-organic meat and dairy produce. This is high in Bovine Growth Hormone and in antibiotics which weaken your immune system and make you more prone to illness. The non-organic cows themselves get ill from their appalling treatment (hence the antibiotics) and their milk is disproportionately high in white blood cells (up to 1.5 million white blood cells per millilitre) – that's pus to you and me! My grandfather was a vet and complained about how much veterinary farm practice changed in the 1950s, becoming mostly about administering injections.
- Vary your diet. Dark leafy greens, whole foods, beans, pulses, seaweeds, nuts and seeds feed your brain, providing, amongst many other vitamins, B vitamins which combat stress and enhance mental performance. They also contain high amounts of magnesium which can reduce cravings in people who tend towards addictive patterns of behaviour with substances like tranquillisers, alcohol or even chocolate. Carbohydrates, much maligned by the diet industry, promote relaxation.
- Some specific foods are particularly good brain foods. These include oily fish (mackerel, salmon, trout, herring, sardines and tuna), which are rich sources of Omega 3 fatty acids, essential for healthy brain function. However, salmon and tuna in particular can be toxic in heavy metals and should be eaten sparingly. An alternative is flax seed oil, which also contains Omega 3 fatty acids. Nuts contain Omega 6 fatty acids and minerals which are used by the brain for cell function. Broccoli, avocado and spinach are good sources of glutathione: this is the body's main antioxidant, which protects brain cells from damage. Betacarotene, found in carrots, sweet potatoes and green vegetables,

has antioxidant properties and is converted in the body to Vitamin A, which improves brain cell activity. Yoghurt, eggs, bananas and fresh lean chicken and turkey contain the amino acid tyrosine, which, according to studies by the US military, gets depleted through stress; your body requires this amino acid to produce neurotransmitters such as dopamine and noradrenalin which sustain memory, concentration, alertness and energy. Eggs are a rich source of choline, used by your body to produce acetylcholine, a neurotransmitter on which your memory depends (Dr Braverman, author of *The Edge Effect: Achieve Total Health and Longevity with the Balanced Brain Advantage* offers more information on the link between acetylcholine deficiency and memory problems. This is summarised on: http://www.nutritional-healing.com.au).

- Watch your iron levels. Vegetarians especially need a diet sufficiently rich in this element. Without enough iron you can become too tired and irritable to work properly, even though you may not be officially anaemic. Iron is particularly an issue for fertile women because menstruation causes loss of iron-rich blood. Many women appear to benefit from increasing their iron levels (but please take specific advice from your doctor). A 2005 study in the Lancet of 76 teenage girls found that those who boosted their iron levels for eight weeks performed significantly better on verbal and memory tests than the group taking placebo iron supplements. According to Dr Tony Helman, Chairman of the Australian Iron Advisory Panel, iron deficiency is found in 1 in 9 teenage girls in Australia… a deficiency provoked by growth spurts, menstruation and poor diet combined.

  Non-animal sources of iron are dark leafy greens, whole foods, cereals, pulses dried fruits and nuts. Vitamin C aids iron absorption. The tannin in tea inhibits it, especially if you drink tea straight after meals.

- Eating a protein-rich breakfast within half an hour of waking stabilises your glucose (blood sugar) levels. Your brain needs to be fuelled by a

steady supply of glucose. A mid-afternoon snack also helps. Glucose is a sugar, but don't imagine that sugary snacks or fizzy drinks do the trick. Research conducted in 2003 by Barbara Stewart from the University of Ulster in the UK found that children whose breakfasts consisted in these high-sugar foods and drinks performed at the level of an average 70 year old in tests of memory and attention.

- Take time to savour food rather than eat it on the run: you'll absorb nutrients better that way.

You may think that in order to build health you need to buy expensive foods and supplements. Not at all. Bridget Aisbitt, nutrition scientist at the British Nutrition Foundation, recommends, instead, a 'superdiet' affordable even on a student budget:

> Although many studies have shown that people who eat lots of fruit and vegetables tend to have better health, this has never been proved for one particular fruit or vegetables, or for supplements containing antioxidants. Another problem with 'superfoods' [blueberries, goji berries, pineapple etc] is that they tend to be expensive. People sometimes [mistakenly] think that a good diet has to be full of exotic ingredients and is out of reach to all but the affluent health freak.
>
> So out with the superfoods and in with the super-diets! A super-diet is based on starchy foods like bread, potatoes, rice and pasta, rich in fruit and vegetables and contains moderate amounts of dairy products and meat, fish or vegetarian alternatives. A well-balanced diet can have real benefits for health. Fresh, frozen, dried and tinned all count towards your five a day, and both juice and pulses can count for one portion a day (but no more).

WATER

There's some controversy over how much water people should drink every day. The advice I'm offering you is based on conventional wisdom such as that of Dr F. Batmanghelidj, author of *Your Body's Many Cries for Water: A*

Revolutionary Natural Way to Prevent Illness and Restore Good Health. This is to drink six to eight glasses of water a day, depending on your weight. Juices don't count as part of this regime. For every cup of tea or coffee, you need an additional glass of water, as tea and coffee are diuretics which elevate the level of urination and dehydrate you. Fizzy drinks and cola drinks also dehydrate you. So does alcohol and, of course, exercise and hot weather, though winter-time is also a 'drying' season that makes it imperative to drink.

However, some experts disagree with the one-size-fits-all 6 to 8 glasses a day recommendation. Dr. Douglas Casa, Director of Athletic Training Education in the University of Connecticut's Neag School of Education, advises instead that you regulate your daily drinking by observing your urine. This should be light-coloured, like lemonade. If it's darker, like apple juice, you need to drink more water.

Whatever way you do it, you should keep tabs on how much water you drink, as dehydration can lead to poor concentration, tiredness, headaches and can impair mental function. Just a two per cent loss in body water can reduce energy levels by 20 per cent. Dr Batmanghelidj's observations have led him to conclude that most Western diseases, including depression, can be caused by dehydration.

If you don't feel thirsty, this may be a sign that you need to drink, as ironically, one symptom of dehydration is lack of thirst! If you're not used to drinking, you'll find it hard to get used to it, but persevere for a few weeks and you'll build up your tolerance and regain your thirst.

However, a different rule applies in an exam situation: don't drink unless you're thirsty. A 2001 study by Peter Rogers and Henk Smit, published in the *New Scientist*, found that drinking water at the wrong time can impair mental performance: the effects are particularly pronounced in activities that require a quick reaction time. 60 volunteers were asked to rate their thirst levels. They then drank either nothing or had a cup of chilled water before having their mental performance measured with a standard computer test. Those who

drank when they were not thirsty recorded scores 15% lower than those who drank nothing.

Those who were thirsty, however, performed 10% better if they had a drink.

Given that you need to drink a lot of water, it makes sense to make it as high quality as your budget will allow. Tap water is full of impurities but you can use a water filter and let it stand for half an hour before drinking. This enables the chlorine gas in it to evaporate away.

You can also make your tap water less acid (see below 'Keep your blood alkaline'). To do this you simply put your jug or glass on a magnet. Magnets are available for order on the Internet and cost about £10.

EXERCISE

Exercise is known to counterbalance the stress responses produced in our bodies by having to meet deadlines and exams, in the following ways:

1. Relieves pent-up frustrations from sitting in lectures, seminars and tutorials, writing essays and revising for exams.
2. Counterbalances a sedentary, intellectual lifestyle.
3. Aerobic exercise releases endorphins into the bloodstream, producing a sense of euphoria and calm.
4. Lowers blood pressure and helps circulation.
5. Relaxes tense muscles.

Exercise also enhances cognitive function in two key ways:

1. Oxygenates your brain. Research by Angela Balding at the University of Exeter has found that schoolchildren who exercise three or four times a week get higher than average exam grades when they reach 10 or 11.
2. Promotes cell growth. Fred Gage from the Salk Institute in La Jolla, California, found that even adults can grow new brain cells and that one of the best ways to do so is through exercise. In excess levels, the stress hormone cortisol damages the hippocampus, one of your brain's

> learning and memory centres and it is the hippocampus that appears to benefit most from the brain-building effects of exercise. In other words, it's possible that exercise repairs damage to the brain caused by stress.

However, as with everything, it's worth exercising in moderation, not to the point of exhaustion. While a half an hour walk three times a week can boost your learning, your concentration and your abstract reasoning by 15 per cent, athletic exercise isn't useful and can weaken your memory and immune system. For instance, a 1995 study at the Max Planck Institute for Psychiatry in Munich took blood tests of older marathon runners who had been running marathons for at least ten years and covered between 75 to 90 miles a week when in training. At around age 55, their bloods contained excess levels of the stress hormone cortisol. Long distance runners were also found to have worse short-term memories than inactive subjects. Runners who logged 90 miles a week had a far higher incidence of colds and infections than runners who logged half that amount.

These and other compelling criticisms of strenuous exercise regimes are put forward by health scientist Dr Peter Axt and medical practitioner Dr Michaela Axt-Gardermann, authors of *The Joy of Laziness: How to slow down and live longer*. Their conclusions are that normal daily exercise is the best way to maintain healthy body and mind. However, if studying prevents you from doing moderate exercise (such as going shopping, climbing stairs, doing housework or walking the dog – or should I say, given that students tend not have dogs, rushing to your tutorials), then a minimal exercise programme is their suggested countermeasure.

The authors recommend a 30-minute brisk walk, three to four times a week – no gym membership necessary.

If your mind is full of worries, Peter Axt also recommends an alternative kind of walking, a 'peripatetic meditation' that he developed in 1980 when working with stressed students whom he was teaching to run:

> …running was not giving them the relaxation they sought. During training, distracting thoughts crowded into their minds… with a simple trick – the participants were to count their steps while running – the problematic thoughts were halted instantly, the runners' heads were free, a feeling of peace and relaxation settled in, and the run became a positive experience. Over the years we've fine-tuned this running meditation somewhat and have used it with great success in treating sleep disturbances, stress, high blood pressure, and mental exhaustion.

Peripatetic meditation, the fine-tuned outcome, involves walking relatively fast while concentrating on your walking pace. You tune out distracting thoughts by thinking a mantra such as 'om' or 'ra' at each step. Or simply repeat a count from one to ten in rhythm with your steps.

The authors advise following your walks with a fifteen minute stretching programme. You can see a slide show explaining how to stretch your major muscle groups on http://www.mayoclinic.com/health/stretching/SM00043&slide=3.

SLEEP

An irregular lifestyle often produces sleep problems. Students are therefore prone to insomnia as they tend to work irregular hours, drink caffeine and alcohol and eat at strange times.

Yet the minimum recommendation of eight hours a night is important not just for your body, but for your mind too: according to neuropsychologist Stanley Coren, at the University of British Columbia, Canada, losing one hour's sleep out of every eight reduces your IQ by one point the following day: "For every additional hour lost, you drop two points. And it accumulates. So if you cheat on sleep by two hours a night over a five day week, you've lost 15 points. If you take the normal run of people – who start with an IQ of 100 – by Friday they're borderline retarded'. Even those with high IQs underperform: 'Short-term memory goes, along with flexible thinking. You talk in clichés. Nor can

you hold complex matters in your head or act on them sensibly. You go on autopilot."

Sean Drummond from the University of California, San Diego, also warns: "If you have been awake for 21 hours straight, your abilities are equivalent to someone who is legally drunk" (over the legal alcohol limit).

This answers the popular question about the value of late-night revision sessions. They aren't usually worth it. It's better to retain your ability to think well by enjoying a good night's sleep, than to burn the midnight oil accumulating information that you may not use wisely in the exam. My *Quick and Easy Guide to How to Stop Panicking and Start Learning at School and University* explains how to avoid pointless swotting.

So if in doubt, err on the side of sleep. According to Drummond, even people who aren't sleep-deprived perform much better than normal on exam-style tasks requiring sustained attention if they sleep an additional hour or two.

Sleep also confers the advantage of storing and consolidating your learning. When you sleep, your brain is actively making links and reactivating circuits triggered by absorption of new material. You remember better what you learnt after a night's sleep – perhaps this explains why school pupils prefer to revise the day before a test, despite parental warnings not to leave everything to the last minute. (At university level, eleventh hour revision isn't wise, by the way.)

Daydreaming is also helpful. I'm sure you've noticed how often you remember someone's name precisely at the point when you give up trying to remember it. Your mind is constantly processing your learning and sifting through your memories even when you're taking a break from your work.

Organic chemist Friedrich August von Kekule's major discovery, the structure of benzene, which had eluded chemistry thus far, came to him in a vision in 1865. As he dozed, he dreamed of whirling snakes. Benzene is an organic chemical compound made up of a ring of carbon atoms. He reported the dream many years after it took place, in a speech at a dinner commemorating his discovery:

> I turned my chair to the fire [after having worked on the problem for some time] and dozed. Again the atoms were gamboling before my eyes. This time the smaller groups kept modestly to the background. My mental eye, rendered more acute by repeated vision of this kind, could not distinguish larger structures, of manifold conformation; long rows, sometimes more closely fitted together; all twining and twisting in snakelike motion. But look! What was that? One of the snakes had seized hold of its own tail, and the form whirled mockingly before my eyes. As if by a flash of lighting I awoke... Let us learn to dream, gentlemen.

If you're having problems sleeping, there are many natural methods of calming yourself. Diet and exercise play an important part in combating insomnia. If you can't sleep, it also helps to:

- Avoid eating just before going to bed.
- Switch your computer at least one hour before going to bed.
- Take your mind off your work by doing something completely different before you go to sleep.
- Keep a notepad by the bed in which you write your worries for the morning.
- Tackle this list in the morning if there is something practical you can do.
- Use Emotional Freedom Technique (EFT), described below in 'A good outlet' to collapse problems and study worries. You can download my *Quick and Easy Guide to Boosting Your Studies and Your Morale with EFT* from my website.
- Command yourself *not* to go to sleep.
- Take your mind off your work in bed by listening to the radio until you're drowsy.
- Make sure you're not dehydrated.

- Keep a snack by the bed if you suffer from early morning insomnia: digesting will help you get back to sleep.

KEEP YOUR BLOOD ALKALINE

This is possibly the strangest advice you'll ever have read, but worth a try if you're feeling mentally sluggish and need a quick pick-me-up. Dr Herman Aihara, a specialist in macrobiotics and author of *Acid & Alkaline*, points out that an acidic blood condition – most usually the outcome of a typical Western diet too rich in animal produce, fats and alcohol – inhibits clear thinking, quick reactions and decisive action. Although dietary changes are key, still, the effects take a long time to show through. So Dr Aihara offers an interim solution:

> For a long time I searched for a quick way to change an acidic to an alkaline condition. Finally, I found one through religious rituals. Japanese Shinto religion strongly recommends performing the misogi ritual, in which one takes a cold water bath or shower in a river, waterfall, or the ocean. One health advocate recommends taking an alternately hot and cold bath. A friend of mine did it, and I saw he was much better than before – physically and spiritually. Therefore, I started taking a cold shower every night after a hot bath. I realised the effect immediately. The cold shower made me very high spirited and gave better brain function. When I was craving some foods such as fish, the cold shower stopped it immediately. It creates tremendous will power and high judging ability. The reason for this lies in the fact that a cold shower makes the blood alkaline, while hot showers (baths) make the blood acid.

He recommends cold-showering from the feet up and allowing ten days for cognitive benefits to manifest. If this is just too "brr!", you might like his other recommendation.

This is to do breathing exercises such as the ones practised in yoga and meditation to reduce the concentration of carbon dioxide from the lungs and

blood. This also helps to make the blood more alkaline (see also my earlier 'Water' section on magnetising drinking water).

A GOOD OUTLET

The never-ending stream of deadlines, assessments and exams that students face every week draws heavily on their emotional, mental and physical resources. To help you meet these challenges in as level-headed a way as possible, it helps to have an outlet that you enjoy, that you can afford and that makes you feel well. For some students, this means doing sports or going to the gym. Others prefer the more holistic arts: yoga, meditation, martial arts, Reiki, Pilates and so forth. It's a very personal choice.

Another key resource in times of stress is emotional literacy. If you don't know or can't express how you feel, you're in a cage. Yet there is opportunity to speak out. For instance, university helplines are there for that very purpose, yet are notoriously underused: it's estimated that 25% of young people need the kind of help they can offer, and yet only three per cent of students use the various counselling and helpline services available.

Talking about how you feel is a crucial important outlet, and your best protection against addictive behavioural patterns. Many students aren't used to talking about how they feel, yet they find it very helpful. I spend at least half my time with my students just listening to their troubles. If you feel constantly deflated on your course, and keep repeating negative patterns in your work, it may help to get good individual help, as having the support of an insightful and empathetic counsellor or advisor can lift your mood and productivity.

Sometimes young people avoid counsellors for fear of being labelled a 'loony' – a misplaced fear, as counsellors and psychotherapists are not doctors or psychiatrists so don't prescribe pills or certify you: they just provide a talking cure. However there are plenty of unhelpful professionals around in every field, and psychotherapy is no exception: it helps to be persistent until you find the right person.

In conjunction with counselling or psychotherapy, or on its own, you may find success with Emotional Freedom Techniques, which you can do on your own or with an EFT practitioner. Many people find this technique extraordinarily effective – it is thought to have an 85% success rate – and I use it on many of my students, with often rapid and astonishing results. EFT works well as a self-help technique and is based on the principles of acupuncture, though instead of using needles, you stimulate acupressure points on your body by tapping them with your fingertips. It takes the sting out of bad memories in a way that many conventional therapies fail to do. I describe this technique more fully for students in *The Quick and Easy Guide to Boosting Your Studies and Your Morale with EFT*. You can download this from my website.

4 Adrian

In case I've given you the alarming impression that you will only succeed in your exams if you live like a monk, it's time to introduce you to Adrian. Not because I'm trying to put him on a pedestal before your eyes, but because he performed exceptionally well in his exams without following the health advice I've outlined in this guide.

He was a fellow student of mine at Oxford University and he behaved in many ways like a typical student in that, aside from a little rowing, I don't think he took much care of his body. He partied. He drank. He undoubtedly took whatever drugs were going round. On sunny days he'd be in the college quad soaking up the sun like a lizard, seemingly without a care in the world, downing cans and cans of Diet Coke. Like many students, Adrian consumed alcohol, nicotine, cannabis, MSG, and probably had enough Aspartame-induced formaldehyde in his system to pickle Damien Hirst himself.

About a month before his Final exams Adrian announced to me, in his usual assured, unflappable manner, "I'm going to get a First'. I tried to chip away at his confidence and introduce a few seeds of doubt. But Adrian was quite certain of his future success. And he did indeed get that First Class degree.

What was his secret? Firstly, he had a lot of vitality: the effects of his party-going certainly didn't show in his student years. Secondly, he was white, male and upper middle class. This placed him in the category of Oxbridge students most likely to get a First since he was well educated, smart, confident and used to sitting exams. But, still, not all clever, fit white middle-class men get Oxbridge Firsts. There was more to it.

And it is this: on top of all these advantages, both Adrian's parents were teachers. Adrian was born into the educational system and had no fear of it. He knew what examiners look for in an exam and he had absolutely first-class

study skills enabling him to perform to task. In other words, he knew what to do, and how to do it. No degree of chemical toxicity could stop him.

So although I'm keen to inform you of the benefits of a healthy lifestyle, I don't wish to put you off going to your next party. Like Adrian, you too may burn the candle at both ends, and still be pleased with your exam results.

Still, I hope you have found the information in this guide helpful in building better emotional, physical and mental resources, and that you will reap many benefits in your studies and beyond.

For more information

What to do if you have used Aspartame is a most useful set of instructions by Dr Russell Blaycock on how to detoxify from many toxic substances: http://www.wnho.net/wtdaspartame.htm

About Eileen Tracy

Eileen Tracy works with students, in the UK and internationally, in person or by telephone and email. She offers EFT and teaches study skills developed in her own exam preparation at Oxford University. She writes for the national press on education and parenting, and appears regularly on radio and television. For more information visit www.eileentracy.co.uk.

Other works by the author

- **The Student's Guide to Exam Success (Open University Press)**
- **The Quick and Easy Guide to How to Stop Panicking and Start Learning at School and at University**
- **The Quick and Easy Guide to Surviving Revision and Exams at School**
- **The Quick and Easy Guide to Boosting Your Studies and Your Morale with Emotional Freedom Techniques**
- **The Quick and Easy Guide to Understanding Question Instructions in Assignments and Exams**

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