

# INTERNATIONAL HEALTH NEWS

*Your Gateway to Better Health!*

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*In this month's issue we present a fascinating article by John Goetz author of "To Health Naturally". John presents a groundbreaking, new hypothesis for human health. The "Equilibrium Theory" provides unique understanding of the inner workings of homeostasis focusing on four interconnected functions, namely Energy, Healing, Stress, and Immune Function. The article was originally published in the British Naturopathic Journal and is being reprinted here with the permission of the author. I hope you will find it as thought-provoking as I did.*

*Also in this issue we provide evidence that echinacea shortens a cold and reduces its symptoms, more proof that fish and fish oils are heart healthy, and new findings regarding the health benefits of various*

*diets. Enjoy!*

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*All the best,  
Hans*

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## Fish & fish oils help protect the heart

IBARAKI-KEN, JAPAN. It is generally accepted that a moderate intake of fish, around two servings a week, reduces the risk of heart disease. But would a higher intake reduce the risk further? This question was investigated by researchers at the University of Tsukuba in Japan, a country in which 95 per cent of adults eat fish at least once a week, with an average fish intake of about 100 grams a day. The researchers gathered data on 19,985 Japanese

men and 21,593 Japanese women aged 40 to 59 years. Participants were given a food frequency questionnaire and monitored for ten years. During this time (477,325 person-years of follow-up), there were 258 cases of coronary heart disease. After taking into account cardiovascular risk factors, exercise and certain dietary factors, those in the highest fifth for fish intake (180 g/d) were at a 56 per cent lower risk of heart attack compared with those in the lowest fifth (23 g/d). However the risk for sudden cardiac death was not reduced. In terms of fatality, the risk of a nonfatal coronary event was lowered (by 57 per cent) but the risk of a fatal coronary event was not lowered (although the small number of cases reduced statistical reliability).

The authors state that, compared with a modest fish intake of once a week or about 20 g/d, a higher intake is linked to a substantially reduced risk of coronary heart disease, primarily heart attack or nonfatal cardiac events, among middle-aged persons. They add that the lowest fifth of fish intake in this study corresponds to the middle fifth in Western studies, among whom risk is already

reduced compared with the Western lowest fifth. They conclude that a high intake of fish can further reduce the risk of initial coronary heart disease events. The team also measured intake of n-3 polyunsaturated fatty acids (present in fish and certain other foods) and found a strong association with lower risk of heart attack (reduced by 65 per cent) and nonfatal coronary events (reduced by 67 per cent).

They suggest several possible underlying mechanisms, such as a reduction in platelet

aggregation and increased levels of vasodilators, which cause blood vessels to dilate. Furthermore, n-3 polyunsaturated fatty acids may reduce the number of inflammatory cells and help prevent atherosclerosis - hardening of the arteries. They may also reduce insulin resistance, blood fats, blood-clotting cells and blood pressure.

*Iso, H. et al. Intake of Fish and n3 Fatty Acids and Risk of Coronary Heart Disease Among Japanese: The Japan Public Health Center-Based (JPHC) Study Cohort I. Circulation, Vol. 113, January 17, 2006, pp. 195-202*

## Review to evaluate diets for weight loss and heart health

BALTIMORE, MARYLAND. With the rising incidence of obesity, there is an increased interest in weight loss and alternative dietary approaches for cardiovascular health, particularly in the light of recent skepticism over the low-fat/heart health hypothesis. Physicians are often asked about diets, so researchers from Johns Hopkins Ciccarone Preventive Cardiology Center reviewed several dietary approaches to improving cardiovascular health and evaluated the evidence.

Firstly they considered low-carbohydrate diets, such as the recently popular Atkins diet. These diets limit complex and simple sugars, causing the body to break down fat to meet energy requirements. Weight loss may occur due to an overall reduction in calorie intake. Trials of low-carbohydrate diets tend to show a short-term benefit in weight loss over low-fat diets, but the benefit usually disappears after one year, and the authors raise several nutritional and cardiovascular concerns such as a potentially higher intake of saturated fat. Despite this, there is some evidence for an increase in high-density lipoprotein (HDL) cholesterol and a reduction in blood fats, but more trials are needed.

Next, the reviewers examined 'glycemic index diets' such as the Zone diet. These encourage intake of foods with a low GI - a measure of blood glucose response. The theory is that high GI foods, such as

sugar and potatoes, increase hunger, obesity, diabetes and cardiovascular disease (CVD). However, there is no evidence that this style of eating prevents CVD, although it may help prevent diabetes. Very low-fat diets, with fat constituting less than 15 per cent of total calories, were considered next. The authors report conflicting results regarding weight loss but evidence of a reduction in CVD on this type of diet.

So-called Mediterranean diets focus on fresh, minimally-processed foods including fish and olive oil, and encourage wine drinking. This type of diet is also linked to a decrease in CVD morbidity and mortality, possibly due to an increase in n-3 polyunsaturated fatty acid intake. The authors describe the evidence here as "consistent", particularly in secondary prevention of heart attack. They report that the Mediterranean-style DASH diet (Dietary Approaches to Stop Hypertension) can lower blood pressure, but may not aid weight loss.

In conclusion, the authors state that none of these diets are perfect, an optimal diet might include less carbohydrates, more fruit and vegetables, plant oils and fish, and a certain amount of whole grains, low-fat dairy and nuts.

*Parikh, P. et al. Diets and cardiovascular disease: an evidence-based assessment. Journal of the American College of Cardiology, Vol. 45, May 3, 2005, pp. 1379-87*

## Review suggests melatonin tablets do not improve sleep quality

EDMONTON, CANADA. Melatonin tablets are not effective for treating sleep problems, finds a recent review of the evidence. Sleep disorders, caused either by lifestyle disruption or a health problem (known as secondary sleep disorders) affect around

one in five people. They are defined as low-quality sleep causing impaired functioning or excessive sleepiness, and can reduce quality of life, and lead to mistakes and potentially dangerous accidents. One suggested treatment is melatonin - a natural

hormone involved in controlling the body clock. As melatonin is becoming increasingly popular, researchers from the University of Alberta examined the evidence. They analyzed 15 randomized controlled trials of melatonin and sleep disorders, with a total of 524 participants. Six studies (with 97 participants) looked at sleep disorders caused by health problems such as a nervous system disorder, and nine (with 427 participants) looked at sleep disorders due to sleep schedule alteration, such as shift work or long-distance air travel. Although the results for 'sleep onset latency' (time taken to fall asleep) favored melatonin tablets over placebo, the effect was not significant, and melatonin had no significant benefit on other measures of sleep quality. These results were found for both categories of sleep disorder.

However, in 17 trials involving 651 participants, melatonin was found to be safe with short-term use but further studies are needed to confirm its long-term safety. Commonly reported adverse events included headache, dizziness, nausea, and drowsiness, but they occurred equally as often with placebo. The authors state that there is no evidence that melatonin is effective in treating secondary sleep disorders or sleep disorders accompanying sleep restriction, such as jet lag and shift work. But the team did not examine the effects on daytime sleepiness caused by jet lag, for which melatonin has shown a benefit in previous studies. They also decided not to select for their analysis several published studies with significant positive results. Successful use of melatonin to counter the

effects of time zone change or shift work may require very careful timing in relation to internal 'circadian' rhythms, although this is dependent on a variety of factors so may be difficult to achieve.

*Buscemi, N. et al. Efficacy and safety of exogenous melatonin for secondary sleep disorders and sleep disorders accompanying sleep restriction: meta-analysis. British Medical Journal, published online 10 February 2006.*

<http://bmj.bmjournals.com/cgi/content/full/332/7538/385>

**Editor's comment:** Contrary to the findings of this study there is some evidence that melatonin may be an effective sleep-aid, particularly for people whose levels are low. German researchers have found that 3 mg of melatonin taken prior to bedtime improves REM sleep significantly, and Israeli researchers report that melatonin is helpful in weaning people off benzodiazepines (Xanax, Ativan, Valium) and can, in some cases, eventually replace these widely used sleep medications[1,2]. I believe melatonin may be helpful for some people, but not for others. Since there is no evidence that short-term use is in any way detrimental, trying it is unlikely to cause harm. A 3 mg capsule or a 1 mg sublingual tablet taken at bedtime or an hour before is the usual protocol.

[1] Kunz, D, et al. *Melatonin in patients with reduced REM sleep duration. Journal of Clinical Endocrinology & Metabolism, Vol. 89, January 2004, pp. 128-34*

[2] Garfinkel, D, et al. *Facilitation of benzodiazepine discontinuation by melatonin. Archives of Internal Medicine, Vol. 159, November 8, 1999, pp. 2456-60*

## 'Right' fats may prevent future illness

WASHINGTON, D.C. New findings from a long-term study suggest that a low-fat diet may not show immediate benefits on cardiovascular disease (CVD) risk factors. The results come from the US Women's Health Initiative Study which includes 48,835 postmenopausal women aged 50 to 79 years. Forty per cent of the women were given an intensive behavioral modification program encouraging a diet high in vegetables, fruits, and grains and low in total fat (type of fat was not monitored). The other 60 per cent of the women ate their usual diet.

A team at Howard University found that, after a mean follow-up of just over eight years, women on the low-fat program ate 8 per cent less fat overall, including 3 per cent less saturated fat, and one

extra serving per day of fruits or vegetables. However, the low-fat intervention did not significantly reduce rates of the main outcome measures - coronary heart disease (CHD), stroke, and CVD. Nevertheless, certain risk factors were significantly improved in the low-fat group, including low-density lipoprotein (LDL) cholesterol and diastolic blood pressure. These improvements were particularly strong among women with lower intakes of saturated fat or trans fat, and higher intakes of vegetables/fruits, as were non-significant trends towards reductions in CHD risk.

The researchers believe that future findings from the study will show a significant effect, and state that dietary changes can have powerful, beneficial effects on CVD risk factors and outcomes. They add

that the results suggest that more focused diet and lifestyle interventions may be needed to improve risk factors and reduce CVD risk. They also point out that nutrition knowledge has progressed dramatically since the study began. We now know

that reducing total fat may not be enough - instead we need to focus on the types of fats consumed.

*Howard, B.V. et al. Low-Fat Dietary Pattern and Risk of Cardiovascular Disease: The Women's Health Initiative Randomized Controlled Dietary Modification Trial. The Journal of the American Medical Association, Vol. 295, February 8, 2006, pp. 655-66*

## Vitamin D's protective effect on bones unravelled

OBU, JAPAN. The importance of vitamin D for the prevention of osteoporosis is well recognized, especially in the elderly population, in whom vitamin D deficiency is common. Researchers have now discovered one of the ways in which vitamin D keeps bones strong, and they may be close to developing targeted drugs for osteoporosis. A team at Japan's National Center for Geriatrics and Gerontology discovered that treating rats with the active form of vitamin D (1,25-dihydroxyvitamin D<sub>3</sub>) inhibited bone resorption and prevented bone loss. They found that this is due to vitamin D inhibiting the production of a protein called c-Fos, which is important in the formation of osteoclasts - specialized cells which oversee breakdown and resorption of bone. Therefore, when c-Fos is inhibited by vitamin D, osteoclast development and activity is suppressed and the natural bone loss through ageing is slowed.

The study involved mice with severe osteoporosis, some of which had their ovaries removed to imitate human osteoporosis more closely, as the condition

is much more common in postmenopausal women with less estrogen. The team also used these mice to look for other agents, similar to vitamin D, which might suppress c-Fos. A compound known as DD281 was identified, and shown to prevent bone loss even more effectively than natural vitamin D.

The authors explain that vitamin D is routinely prescribed for the treatment of osteoporosis, but little has been known about how it regulates bone cell function. They state that this study clarifies how vitamin D helps limit bone resorption in conditions such as osteoporosis. Further trials are needed using DD281 for the treatment of osteoporosis and other bone diseases associated with excessive bone resorption, they believe, due to the compound's potent antiresorptive action.

*Takasu, H. et al. C-Fos protein as a target of anti-osteoclastogenic action of vitamin D, and synthesis of new analogs. The Journal of Clinical Investigation, Vol. 116, February 2006, pp. 528-535.*

<http://www.jci.org/cgi/content/full/116/2/528>

## Echinacea reduces symptoms and shorten duration of colds

MUNICH, GERMANY. There is now compelling evidence that Echinacea may be helpful for those suffering with a cold. Echinacea is extracted from the herb *Echinacea purpurea*, and is widely used in European countries and in North America to reduce the symptoms and duration of colds and flu-like illnesses. It is believed to work through short-term stimulation of the immune system, but research findings have so far been inconclusive.

Now a research team based at the Center for Complementary Medicine Research in Munich has reviewed the evidence and concludes that Echinacea might reduce cold symptoms, although it does not appear to prevent them. They examined 16 randomized controlled trials of alcoholic extracts and pressed juice extracts from the aerial (above ground) parts of Echinacea. Nine trials showed a reduction in cold

symptoms and duration if treatment began early. The authors report that their systematic review found some evidence that preparations based on the aerial part of *Echinacea purpurea* might be effective for the early treatment of colds in adults, but results are not fully consistent. However, no benefit was found from other preparations of the plant. They add that consumers and clinicians need to realize that Echinacea products differ greatly in the species and parts of the plant used, the way they have been prepared and in the active agents they contain. Some contain a mixture of different active components, each of which may act separately or together. The researchers point out that if a synergistic action occurs then the exact composition of the extract will greatly affect its performance.

This review focused on products which contained only Echinacea, but there are other products

available which combine Echinacea with extracts from additional herbs, potentially increasing their effectiveness.

Linde, K. et al. *Echinacea for preventing and treating the common cold. The Cochrane Database of Systematic Reviews, January 25, 2006, Issue 1*

## NEWSBRIEFS

### Greater fruit and vegetable intake cuts stroke risk

Eating fruit and vegetables is strongly linked to a lower risk of stroke, researchers have discovered. A team from the University of London analyzed data from eight reliable studies involving over 250,000 people from Europe, Japan, and the USA. They found that people who ate three to five servings per day had an 11 per cent lower risk of stroke than those eating less than three. Those who ate over five portions had a 26 per cent lower risk. The researchers state that if an intake of five or more servings per day was achieved among the general population, stroke morbidity and mortality would be greatly reduced, as would rates of other cardiovascular disease and some cancers. An expert from the University of Minnesota comments that food habits develop in childhood, so young people must be targeted. Partnerships must be formed between public health agencies, industry, and the media to promote healthy food choices, she adds.

He, F.J. Nowson, C.A. and MacGregor, G.A. *Fruit and vegetable consumption and stroke: meta-analysis of cohort studies. The Lancet, Vol. 367, January 28, 2006, pp. 320-26*

Steffen, L.M. *Eat your fruit and vegetables. The Lancet, Vol. 367, January 28, 2006, pp. 278-79*

### Fracture risk from popular blood thinner

The blood-thinning drug warfarin may pose a risk of bone fracture, suggests new research. Warfarin (brand name Coumadin) is an anticoagulant drug which works by interfering with the role of vitamin K in blood clotting. It is often used to reduce the risk of clots in patients with atrial fibrillation - a form of abnormal heartbeat. However it could also reduce bone strength, warn scientists from Washington University, because vitamin K is also involved in a protein needed for bone formation called osteocalcin. They looked over Medicare records of about 15,000 patients hospitalized with atrial fibrillation, and identified fractures related to osteoporosis. Use of warfarin for more than a year led to a 25 per cent increase in fracture risk. The team recommends that physicians carefully monitor the bone health of patients on warfarin.

Gage, B.F. et al. *Risk of Osteoporotic Fracture in Elderly Patients Taking Warfarin: Results From the National*

*Registry of Atrial Fibrillation 2. Archives of Internal Medicine, Vol. 166, January 23, 2006, pp. 241-46*

**Editor's comment:** The detrimental effect of warfarin on bone health was first reported in 1999. Following is the IHN abstract of work done at the Mayo Clinic on this subject:

ROCHESTER, MINNESOTA. Warfarin (Coumadin) is a commonly used anticoagulant, which is prescribed in order to prevent blood clots and ischemic strokes. Among other detrimental effects warfarin inhibits the action of vitamin-K, a crucial factor involved in the formation of bone mass. It is therefore not surprising that researchers at the Mayo Clinic have discovered that long-term use of warfarin markedly increases the risk of osteoporotic fractures of the vertebrae and ribs. Their study involved 572 women (99 per cent white) aged 35 to 95 years (average age of 63.9 years) who had experienced a venous thromboembolism (blood clot) prior to their entry into the study during the period 1966 to 1990. The women were all prescribed warfarin after their incident and had been taking it for periods ranging from 0 to 27.4 years. All told a total of 480 fractures occurred during the 6314 person-years of follow-up. The researchers found that women who had been taking warfarin for a year or more had a 5.5 times greater risk of having a spinal fracture and a 3.4 times greater risk of a rib fracture than would be expected. Even taking warfarin for less than three months increased the risk of vertebral failure by a factor of 2.4 and the risk of rib fractures by 1.6. The study also confirmed that advancing age and a history of cancer or liver disease are potent risk factors for osteoporotic fractures. After adjusting for other variables the researchers conclude that taking warfarin for a year or more increases the risk of vertebral and rib fractures by a factor of two. Caraballo, Pedro J., et al. *Long-term use of oral anticoagulants and the risk of fracture. Archives of Internal Medicine, Vol. 159, August 9/23, 1999, pp. 1750-56*

### Aspirin prevents cardiovascular illness

Aspirin reduces the risk of cardiovascular disease, but it works differently in men and women, new research suggests. An analysis of data from over 95,000 patients by a researcher at Duke University found that aspirin significantly reduces the risk of a first cardiovascular event - stroke, heart attack or death from cardiovascular causes. Aspirin lowered risk by 12 per cent in women, and 14 per cent in

men. The reduction was due to fewer heart attacks in men and fewer strokes in women. These findings suggest that women can benefit just as much from aspirin therapy as men. The researcher believes that aspirin should be discussed with all at-risk patients, as it has been used for many years, is well-understood, effective, inexpensive and widely available. However, the study also confirmed that aspirin carries a risk of major bleeding, so the author concludes that it should never replace established methods of reducing cardiovascular risk such as healthy diet and exercise.

*Berger, J. et al. Aspirin for the Primary Prevention of Cardiovascular Events in Women and Men: A Sex-Specific Meta-analysis of Randomized Controlled Trials. The Journal of the American Medical Association, Vol. 295, January 18, 2006, pp. 306-13*

### **Common drugs may cause mental deficits in elderly**

Widely-used anticholinergic drugs may be causing mild cognitive impairment in the elderly, new findings suggest. They are commonly used to calm the nervous system in conditions such as irritable bowel syndrome, urinary incontinence, and Parkinson's disease. Any adverse effects could have a large impact on the population.

Researchers at Hopital La Colombiere, France followed 372 elderly people without dementia for up to eight years. The participants who took anticholinergic drugs for more than a year showed poorer results on tests of reaction time, attention, memory, 3D skills and language than the other participants. Eighty per cent fell into the category of 'mild cognitive impairment', compared with 35 per cent among non-users. Further analysis confirmed that anticholinergic drugs were significantly linked to later impairment. This could be adding to the mild cognitive deficits often found in people over the age of 65. Anticholinergic drugs should be considered as a possible reversible cause of mild cognitive impairment, the authors conclude.

*Ancelin, M.L. et al. Non-degenerative mild cognitive impairment in elderly people and use of anticholinergic drugs: longitudinal cohort study. British Medical Journal, Vol. 332, February 25, 2006, pp. 455-59.*

<http://bmj.bmjournals.com/cgi/content/full/332/7539/455>

**Editor's comment:** Anticholinergic drugs include atropine, scopolamine, and certain antihistamines, antipsychotics (chlorpromazine), antispasmodics,

and cyclic antidepressants (amitriptyline, desipramine and nortriptyline).

### **Stress at work raises heart disease and diabetes risk**

Chronic stress is known to affect the heart, so a team at University College London followed 10,308 British civil servants over 14 years, looking at rates of stress and the metabolic syndrome - a group of risk factors for heart disease and type 2 diabetes. Job stress, measured by questionnaire, was clearly linked to the metabolic syndrome in a dose-response manner. The link was stronger in men than women, and in people in lower employment grades. The authors report that employees with chronic work stress were more than twice as likely to have the syndrome as those without. They believe the study provides evidence for a biological link between prolonged everyday stress and illness, suggesting that it might directly affect the autonomic nervous system and neuroendocrine activity, or interferes with biological homeostasis, including insulin resistance.

*Chandola, T., Brunner, E. and Marmot, M. Chronic stress at work and the metabolic syndrome: prospective study. British Medical Journal, published online 20 January 2006.*

<http://bmj.bmjournals.com/cgi/rapidpdf/bmj.38693.435301.80v2>

### **Diet could explain health benefits from wine**

Wine is thought to protect people from heart disease and certain cancers, but could it be that what accompanies the wine is equally important? A new study shows that wine drinkers tend to eat healthier food than those who buy beer, possibly accounting for their lower rates of illness. Researchers from the National Institute of Public Health in Denmark analyzed 3.5m supermarket transactions. Wine buyers bought more fruit and vegetables, olives, poultry, cooking oil, and low-fat items, whereas beer buyers bought more ready cooked dishes, sugar, butter, high-fat meats and soft drinks. These findings are in line with previous results from the US and France which found that people who drink wine tend to eat more fruit, vegetables, and fish and use more cooking oil and less saturated fat. The researchers conclude that the link between type of alcoholic drink and health could be due to other factors such as diet.

*Johansen, D. et al. Food buying habits of people who buy wine or beer: cross sectional study. British Medical Journal, published online 20 January 2006.*

<http://bmj.bmjournals.com/cgi/rapidpdf/bmj.38694.568981.80v1>

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## Restoring the Balance: An Introduction to *Equilibrium Theory*

by John Goetz

*The sciences of physiology and nutrition currently exist in isolation. Equilibrium Theory marries these two fundamental health providers with precise correlations, thereby enabling one to truly live Hippocrates' words: "Let food be your medicine."*

SIGNIFICANT advances in science often come through theories, for example Pasteur's germ theory, Darwin's theory of evolution and Einstein's theory of relativity. In these and many other theories, an underlying general principle explains complicated observations and phenomena. By finding the general principle, a theory organises and simplifies knowledge in a particular field. It transforms thinking - the old familiar world gives way to new understanding.

This paper presents a groundbreaking new theory of human health, *Equilibrium Theory*, which condenses the large body of medical knowledge on human physiology into an easy-to-understand, easy-to-use general principle. The theory conforms to medical science, and goes beyond that science to decipher baffling physiological evidence. Two significant applications come from the theory.

First, *Equilibrium Theory* identifies human nutritional requirements in a fundamental new way - a direct correlation between physiology and nutrition. The resulting nutritional programme provides simple and flexible complete nutrition that adjusts easily for lifestyle and current needs.

Second, *Equilibrium Theory* solves the longstanding mystery of chronic diseases, revealing the mechanisms behind and solutions to osteoarthritis, rheumatoid arthritis, multiple sclerosis (MS), lupus, fibromyalgia, chronic fatigue syndrome and many more.

Except for genetic and environmental factors, physiology and nutrition control health. Physiology governs internal functions and activities, especially how glands and organs work. Nutrition provides the raw materials, such as vitamins, minerals and trace elements, for glands and organs to synthesise and secrete hormones and other end products necessary for life. Targeted nutrition for each function in the body builds vigorous health and long life, and eliminates diseases and their root causes. The sciences of physiology and nutrition currently exist in isolation. *Equilibrium Theory* marries these two fundamental health providers with precise correlations, thereby enabling one to truly live Hippocrates' words: "Let food be your medicine." To achieve this coupling, the theory further defines and characterises the medical term, "homeostasis": stability and equilibrium in a physiological system through feedback. Homeostasis is the internal dialogue of harmony going on in all living things. The great philosophers throughout history teach harmony too - in one's life, mind and relations with others. *Equilibrium Theory* extends that work in progress to the delicate, complicated physical self. And physical harmony, working with and not against one's own internal homeostasis, advances mind-body-spirit wellness.

The physical world confounds and thwarts the human mind at every turn, but it often hides a solution in plain sight. Not so many centuries ago, our ancestors looked up at the sun and full moon in wonder and saw only round sacred objects. A new perspective would change the world forever. During the Renaissance, a corps of discoverers saw spheres and the shadow of a sphere on the moon, and realised that there was something profound about the earth and its place in the solar system. Somewhere health hides a similar secret and simple key... perhaps as follows.

The delicate, complicated physical body lives a hard reality indeed. Eat, drink and breathe, or there's no thinking, acting, living output. Food is the primary input, and food consists of four distinct compositional types: carbohydrates, proteins, fats and fibre. Why four, and does that say something profound about the human body, how it developed and how it handles the challenges of life?

The general principle of *Equilibrium Theory* is the following new understanding of the inner workings of homeostasis. Within the human body and its network of glands and organs, four interconnected functions — Energy, Healing, Stress and Immune - work in healthy equilibrium, or internal balance. The body's response to all internal needs and external forces lies within and must adhere to this four-part harmony. Moreover, these tasks are the template for all nutrition. Thus with the perfect symmetry of nature, each food type nourishes one of the four functions: carbohydrates for energy, proteins for healing, fats for stress (cells burn fat instead of glucose, a true definition of stress!), and fibre for immune. The same direct relationship and necessary equilibrium apply to all other nutrients and their nutritional categories: B vitamins, fatty acids, trace metals (minerals), and herbs.

Homeostasis is the basis of natural therapeutics, including nutrition and acupuncture, and therefore an important key in finding natural solutions to health and disease. Using *Equilibrium Theory*, on-target nutrition can build health and eliminate dysfunctions and disease in crucial energy, healing, stress and immune systems. Such complete nutrition is life-giving, restorative and forgiving.

Like other theories, *Equilibrium Theory* involves subjective insight and discovery, and will require objective testing and confirmation. However, two objective findings give immediate credence and weight to this theory:

1. The central concept of a four-part harmony in Energy, Healing, Stress and Immune functions explains all observed human physiology including zinc-copper antagonism and the puzzling results of beta-carotene, cardiovascular and cancer studies; and
2. *Equilibrium Theory* correctly predicts the pathologies of chronic diseases. For example, it reveals why arthritis divides into two main types, and then describes the pathology of both osteoarthritis and rheumatoid arthritis precisely, i.e. osteoarthritis is a degenerative disease in the protein structures of cartilage, while rheumatoid arthritis is an autoimmune disease in the connective tissue of cartilage.

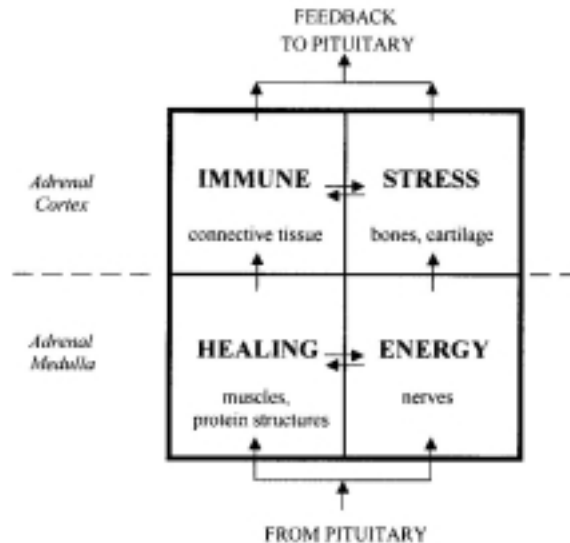
### **Introduction to equilibrium physiology**

The endocrine system largely controls physiological activity in the human body. The major endocrine glands are the pituitary, adrenal, thyroid, pancreas and liver. Other glands act in supporting roles: hypothalamus, pineal gland, sex glands (ovaries or testes), parathyroid gland and the lymphatic system, including thymus and spleen. While the pituitary gland regulates this complicated endocrine system, the physiology of the adrenal gland dictates the action - how the body responds to *all* internal needs and external forces. For this reason, the adrenal gland is critical to homeostasis and health.

### **Functions**

Functions are tasks that are programmed into the human body to meet all the challenges of our environment. The adrenal gland runs the most important task programme, with four primary functions - Energy for today's activities, Healing of the body, whether normal breakdown and repair or from injury, Stress, i.e. handling stress, and Immune response and system - and many lesser or subfunctions within these primary ones. The illustration below is a construct, a simple model to explain and predict how the complex adrenal gland works. It does not depict physical structure; rather it is a schematic of the primary functions, dependent body systems and normal functional flow or communication within the endocrine system.

It reveals a four-part harmony in the adrenal tasks of Energy, Healing, Stress and Immune. This is the key discovery and central concept of *Equilibrium Theory*. The adrenal gland undertakes four tasks, often at the same time: energy czar, healing supervisor, stress manager and minister of defence. The gland has two identifiable physical parts: medulla and cortex; and four primary functions: Energy, Healing, Stress and Immune with "dependent body systems" listed under each. The arrows indicate normal functional flow; equilibrium arrows denote balance between functions within the medulla and cortex.



### Medulla

The adrenal medulla is divided into two functional (not physical) parts, Energy and Healing. These parts have to be in balance or equilibrium with each other. Neither primary function dominates over the other. Basically, Energy and Healing share medulla resources in a give-and-take relationship, going back and forth depending on current body needs. Energy comes principally from the medulla hormone epinephrine (adrenaline). Nerves are interconnected with and dependent upon Energy/epinephrine, thus the term "dependent body system." If something goes wrong with Energy functioning, something will go wrong with the nervous system. The other half of medulla equilibrium is Healing (primary adrenal function) and muscles and protein structures in the body (its dependent body system). All muscle diseases lie in this Healing province.

It is common medical knowledge that the adrenal medulla receives pituitary instructions via the central nervous system and neurotransmitters. Reacting to these, it manufactures and secretes two major hormones, epinephrine and norepinephrine. Epinephrine directs fight or flight response, increasing heart rate, cardiac output, blood pressure and carbohydrate metabolism. Norepinephrine, both hormone and neurotransmitter, has like but limited hormonal action, constricting blood vessels and dilating bronchial tubes. Meanwhile, Healing activities largely take place outside of the adrenal gland. Bear in mind that the illustration does not clarify chemistry or where that chemistry takes place; it models functions and how they interact.

### Cortex

The adrenal cortex is similarly divided into two functional parts, Stress and Immune, which have to be in equilibrium. Neither primary function has an absolute right to cortex resources. Stress and Immune are coupled in a dance for life, as are medulla Energy and Healing. Stress, or better said, "the ability to handle stress," comes from the cortex hormone cortisol. The often-prescribed steroid cortisone is an imperfect copy of cortisol, and an imperfect attempt to restore proper function here. The dependent body system of Stress is bones and cartilage. Stress diseases manifest in bone and cartilage, typically arthritis. Immune system is the other primary function in the back and forth cortex equilibrium tango. Connective tissue is its dependent body system.

Once again, it is common medical knowledge that the cortex manufactures and secretes two steroidal hormones: cortisol (known as a glucocorticoid) for fighting stress and for inflammatory and immune system suppression, and aldosterone (mineralocorticoid) to control sodium/potassium and water balance in the body. The cortex also releases some male hormones. In both sexes, the cortex is directly involved in sexual functioning and connected to the ovaries or testes. Immune system activities occur mostly outside of the adrenal gland and within bone marrow, thymus, spleen and the lymphatic system, there producing B-lymphocytes, T-lymphocytes and other white blood cells.

## **Dependent body systems**

Dependent body systems are systems seemingly in no way connected to the adrenal gland, yet they require proper adrenal functioning and health to maintain their own well being. How can this be? How can these distant, large systems - nerves; muscles and protein structures; bones and cartilage; and connective tissue be brought down to dysfunction and disease by the tiny adrenal gland?

The best explanation is an example, the common worldwide scenario of a lifetime of too much stress wearing out the Primary Stress Function and causing permanent imbalance between Immune and Stress. Immune system dominates, leading to autoimmune diseases, that is the body attacks itself. Responding all the time but with no foreign invaders to fight, the Immune function attacks injured tissue instead. In this case, the autoimmune complaint is arthritis, an attack on bone cartilage, which in the illustration is the dependent system of a worn-out, exhausted Stress function. In essence, the illustration predicts where the attack will occur and what the underlying cause is; therefore it becomes a powerful tool in understanding and solving this and many other chronic diseases. Rheumatoid arthritis involves Stress exhaustion and resulting imbalance of the Immune/Stress equilibrium (instead of a normal, healthy Immune/Stress equilibrium). Osteoarthritis adds a dominating Healing exhaustion. Constant inflammation from the attack and mounting cartilage damage produce painful symptoms.

Treating symptoms is endless folly and in the end counterproductive. Cure comes only by correcting the adrenal exhaustion and imbalance, which is the underlying cause. Restore cortex equilibrium and the attack on cartilage will instantly stop. Then, the body can begin healing. Stress-arthritis is the archetype for chronic diseases. In the same way, other primary functions and subfunctions give rise to distant disease. Energy function disorders can lead to serious nerve diseases such as multiple sclerosis (MS) and amyotrophic lateral sclerosis (ALS, Lou Gehrig's disease). Healing problems can manifest in muscles with fibromyalgia and other muscle diseases. For Immune, lupus (systemic lupus erythematosus) is an autoimmune assault on connective tissue. Like arthritis, lupus is autoimmune in character, but the initiating cause is too much Immune with hyperactivity in one or more lymphocyte types, not an exhausted or hypoactive Stress function.

At the other extreme, an exhausted hypoactive Immune function wrecks primary - NOT dependent body system - havoc with susceptibility to infections, colds and flu, candidiasis (yeast infection), shingles (herpes zoster), Legionnaire's bacteria, cancers, etc. Where any dependent body system attack comes depends on where the adrenal gland first goes haywire. Sometimes, though, "where" is more complicated than the dependent systems depicted in the illustration. Interactions occur, and other dependent systems exist and are tied to adrenal functions in more complex ways. For example, skin depends upon total medulla health, Energy and Healing together. Heart and red blood cells rely mostly on Stress mechanisms, while white blood cells obviously require well-maintained Immune mechanisms. Where exactly chronic disease will strike also depends on specific underlying adrenal causes, including subfunction variations and multiple dysfunctions of first cause (the setup for disease) and second cause (precipitating event, often trauma). All these contribute to unique final outcomes and explain the myriad of disease possibilities. The modus operandi of attack on a dependent system is almost always hyperactive Immune (autoimmune) or hypoactive Healing (degenerative) in character, or both.

To cite a complex disease process, osteoarthritis actually develops from two separate dysfunctions. First-cause Stress exhaustion induces arthritis, an autoimmune attack on cartilage. Subsequently, a dominating second-cause Healing exhaustion modifies the disease to a degenerative attack on the protein structures (Healing's dependent system) of cartilage. And, in fact, this is the exact pathology of osteoarthritis reported in the scientific medical literature.

## **Normal Functioning**

The arrows in the illustration indicate the course or flow of functioning or tasking. The adrenal gland receives instructions via neurotransmitters and hormones from the pituitary. General instructions come first to the adrenal medulla, which in turn can stimulate the cortex. This then sends feedback to the pituitary to further regulate adrenal response to exactly meet body needs. This 'feedback loop' is one of thousands in the human body; many involve pituitary oversight. Feedback produces stability and equilibrium in a physiological system, and is technically known as homeostasis or homeostatic mechanism. Loss of homeostasis leads directly to poor health and disease.

The usual work of the adrenal gland, such as handling the daily stress (cortex) of life must first involve energy and epinephrine (medulla). In like manner, the immune system must be brought to action by healing, and in fact healing and immune activities together share the inflammation mechanism. And so a natural division exists in adrenal

functioning, not between medulla and cortex, but between the two functional sides of medulla and cortex. Energy and Stress functions go together to form one "action plan" (from one set of general instructions), and likewise for Healing and Immune.

Adrenal equilibriums - Healing/Energy and Immune/ Stress - operate at cross-purposes to and yet blend with the two actions plans of Energy/Stress and Healing/ Immune. Good adrenal health requires both equilibriums, which move back or forth as needed, and the action plans. Complicated? A little. Adrenal functioning is woven like tapestry, producing a beautiful design in form and function.

The pituitary can at any time override general instructions (the two action plans) and adrenal equilibriums, and write specific instructions to achieve any task, for example: "Immune Function: Urgent, fight the flu." Or, pituitary ACTH (adrenocorticotrophic hormone) orders the Stress hormone cortisol into action. Direct feedback to the pituitary on specific instructions guarantees a correct, measured response. Again, although the pituitary regulates and controls, it is adrenal gland physiology that dictates the action. In effect, it is easier to think of the adrenal gland, say, adjusting Healing/Energy to fix a skinned knee.

Adrenal equilibrium can be temporarily out of balance. When recovering from surgery, the Healing function dominates over Energy function and one feels like staying in bed — no energy! When fighting the flu, Immune function dominates over Stress function, and the stress of one's job is just too much that day. If this person decides to go to work anyway, the adrenal gland will try to adjust to these two opposites, probably with poor results for both. Not surprisingly, the adrenal gland and body have great difficulty achieving opposite functions in the extreme. Worse than opposites, however, is one constant effort. For instance, workaholism - constant job stress, bringing it home, taking it to bed - can leave an individual susceptible to minor immune lapses and in time to serious disease. The cornerstone of good health is TEMPORARILY out of balance. When temporarily becomes CONSTANTLY, homeostasis and health get out of sync and fall apart. Adrenal equilibriums plead for equilibrium in one's life. Balance, equanimity, harmony - the spiritual teachings of the great philosophers may be rooted in our physical nature, the internal physiology of homeostasis and a four-part harmony in Energy, Healing, Stress and Immune functions.

If healthy, an individual's immune response to the everyday environment is not a problem. It involves killing bacteria viruses, fungi and other pathogens that attempt to invade the body all the time, and with no apparent effect on Stress ability, the opposite function. However, as the difficulty increases — cold, flu, pneumonia - Primary Stress Function loses importance as the endocrine system marshals all its forces to fight the invader. The Immune/Stress equilibrium swings more and more resources to the immune system and attempting any stressful activity at this time proves to be counterproductive to disastrous. One's approach to health should always be ... don't get in the way of the body's natural responses.

### **Overview**

A paradigm shift is occurring in medicine from a disease-based approach to a prevention- and healing-based approach. Naturopathy is at the forefront of this revolution in health care. The basic principles of naturopathic medicine are: Do the patient no harm; Nature can heal; the human body has the power to heal within it; Treat causes, not effects; Prevention is the best cure; Treat the whole person. Mind-body-spirit wellness.

Equilibrium Theory adds one more vital principle to this holistic model: Internal balance. The body's response to all internal needs and external forces lies within and must adhere to a four-part harmony in Energy, Healing, Stress and Immune functions. This key unlocks the inner world of health. With this new and detailed understanding of the internal mechanisms of homeostasis, we can optimize health using targeted nutrition for each gland and function in the body. Nutrition supplies the raw materials, and physiology turns out the end products of life's amazing chemistry. A complete discussion of *Equilibrium Theory* including on-target nutrition for Energy, Healing, Stress and Immune functions and subfunctions is given in the author's book, *To Health... Naturally!* For more information, go to the Internet site: <http://www.tohealthnaturally.com>

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