

# INTERNATIONAL HEALTH NEWS

*Your Gateway to Better Health!*

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SARS (severe acute respiratory syndrome) is very much on our minds these days. Is it safe to fly? What are the chances of catching SARS? How serious an infection is it? What can be done to prevent it? All these questions and more are answered in this month's feature article by our New Zealand correspondent Dr. Maurice Mckeown.

Despite the many recent attacks in the popular press on the benefits of vitamins, medical journals continue to publish credible, peer-reviewed research on the many benefits of judicious supplementation. Vitamins C and E help stop atherosclerosis and vitamin E may help prevent Alzheimer's disease. Magnesium improves the quality of life of heart disease patients and just a daily multivitamin pill will materially reduce the risk of infectious diseases among diabetics. Other supplements have been found to help prevent prostate cancer, stroke, heart attacks, and rheumatoid arthritis. Good news indeed and all in this month's issue.

Last, but certainly not least, is a review of Dr. Loren Cordain's new book on the paleo diet by our regular contributor Dr. William Ware.

Enjoy!

*Yours in health,*  
Hans Larsen, Editor

## June Highlights

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fillings were loose and had new bacteria growing underneath. They were expanding and contracting due to heat and cold and had cracked two of my molars which caused sensitivity. It has been raining like crazy here for days and I have been migraine free! I believe my migraines were due to the silver amalgams in my mouth.

RD, USA

**Editor:** Thank you for sharing your experience with migraines and silver dental fillings. I am pleased to hear that you are now migraine free!

\*\*\*\*

What do you know about HGH (human growth hormone) supplementation? They make it sound like the fountain of youth! Are there any studies you have seen?

WT, USA

## LETTERS TO THE EDITOR

I recently had all my silver dental fillings removed. I suffered from terrible migraines that would sometimes cause me to vomit. I had a CT scan and everything seemed fine. Nobody could figure out why I suffered so. I would get migraines when it rained due to the low barometric pressure. My

**Editor:** *Pretty well all I know about HGH is summarized in my article found at [www.yourhealthbase.com/growrewb.html](http://www.yourhealthbase.com/growrewb.html) I would not advise taking them unless you have been found to be seriously deficient.*

\*\*\*\*

I recently read Linus Pauling discovered that taking 3 grams of vitamin C daily reduced "stress". The information came from a biographical article that did not specify the kind of stress. Is this a meaningful statement?

WM, USA

**Editor:** *I like Dr. Hans Selye's definition of stress "Stress is the nonspecific response of the body to any demand made upon it". Stressors can be physical, emotional, work-related, etc. Stress is accompanied by an increased production of free radicals resulting in, what is now known as, oxidative stress. Oxidative stress occurs when the body's antioxidant defenses are unable to cope with these free radicals. Vitamin C is a strong antioxidant so it would materially help in coping with oxidative stress and thus, indirectly, with any kind of stress. There is also evidence that high daily doses (eg. 3 grams/day) can help decrease depression.*

## ABSTRACTS

### Chinese herb benefits arthritis patients

VANCOUVER, CANADA. Several studies have shown that an extract of the Chinese herbal remedy *Tripterygium wilfordii* (TW) is effective in the treatment of severe rheumatoid arthritis. Unfortunately, side effects are frequent when the herb is administered orally. A team of Canadian and Chinese researchers has now evaluated the effectiveness of topical application of TW to affected areas. Sixty-one patients with rheumatoid arthritis were randomized to apply either a TW tincture or a placebo tincture to painful/swollen joints 5-6 times per day. At the end of six weeks patients in the TW group had substantially fewer swollen joints, less morning stiffness, improved grip strength, and both patients and physician noticed a remarkable

overall improvement in the TW group. Patients in the TW group were 8 times more likely to experience at least a 20% improvement than were the placebo group patients.

The researchers conclude that their trial supports the efficacy of TW in the treatment of rheumatoid arthritis, but caution that a larger trial is needed before the efficacy of topical application can be judged.

*Cibere, Jolanda, et al. A randomized double blind, placebo controlled trial of topical Tripterygium wilfordii in rheumatoid arthritis: reanalysis using logistic regression analysis. Journal of Rheumatology, Vol. 30, March 2003, pp. 465-67*

### Vitamins C and E help stop atherosclerosis

KUOPIO, FINLAND. Atherosclerosis is a disease of the arteries in which fatty, often calcified deposits develop on the inside of the arterial wall (intima) and eventually cause blockages that lead to cardiovascular disease (angina, heart attack and stroke). The progression of atherosclerosis can be followed by measurement of the thickness of the intima with ultrasonography.

Finnish researchers reported about 3 years ago that supplementing with a combination of vitamin C and vitamin E markedly reduced the increase in intima thickness. The researchers now report the

results of a further 3 years of follow-up. The study involved 440 men and women between the ages of 45 and 69 years. All participants had cholesterol levels at or above 5.0 mmol/L (193 mg/dL) and both smokers and non-smokers were included. The participants were randomized into two groups – one receiving 136 IU of natural vitamin E (d-alpha-tocopherol) and 250 mg of slow-release vitamin C (ascorbic acid) twice daily with meals, the other receiving placebos.

The researchers observed an average annual increase in intima thickness of 0.014 mm in the

placebo group as compared to 0.010 mm in the supplement group corresponding to a substantial 25% treatment benefit. Further analysis showed that the benefit was limited to male participants. Here the treatment benefit was 37% as compared to an insignificant 14% among women. The benefit of supplementation was greatest among participants with low baseline levels of vitamin C and among those with existing plaques in the carotid artery. Plasma levels of vitamin E and vitamin C increased by 57% and 38% respectively over the 6 years of supplementation.

The researchers emphasize that vitamins C and E must be taken together as vitamin C is needed for regeneration of vitamin E. It would also appear that it may be crucial to use natural vitamin E (d-alpha-tocopherol) rather than synthetic (dl-alpha-

tocopherol) in order to achieve the desired effect. They point out that the treatment effect among participants who had carotid plaques at baseline was more than 50%. This is comparable to the effect of the most effective cholesterol-lowering drugs (statins), but with no adverse effects and at a much lower cost. Researchers at the UC Davis Medical Center suggest that the optimum regimen may well be 600-800 IU/day of natural vitamin E plus 500 mg/day of vitamin C.

*Salonen, Riitta M., et al. Six-year effect of combined vitamin C and E supplementation on atherosclerotic progression. **Circulation**, Vol. 107, February 25, 2003, pp. 947-53*

*Jialal, I. and Devaraj, S. Antioxidants and atherosclerosis: Don't throw out the baby with the bath water. **Circulation**, Vol. 107, February 25, 2003, pp. 926-28 (editorial)*

## Magnesium benefits heart disease patients

TEL AVIV, ISRAEL. A team of American, Austrian and Israeli researchers has found that heart disease patients tend to have lower intracellular magnesium levels than do healthy people. Their study involved 187 patients (151 men and 36 women) who had undergone coronary bypass surgery or angioplasty or had suffered a heart attack. The patients were randomized to receive 365 mg of elemental magnesium (in the form of citrate) daily or a placebo for six months. The average intracellular magnesium level (analyzed in scraping from under the tongue) in the entire group was 33.5 mEq/L, which is well below the normal level of 37.9 mEq/L. About 75% of participants in the US and Israel were found to be magnesium deficient.

At the end of the six months the magnesium level in the supplemented group had increased to an average of 35.5 mEq/L versus 32.6 in the placebo group. The participants were given a complete medical examination, including a treadmill test at

the beginning and end of the study. Patients in the magnesium-supplemented group increased their exercise duration by 14% over the six months while no change was observed in the placebo group. Instances of exercise-induced chest pain also decreased substantially in the magnesium group. Only 8% of the magnesium-supplemented patients experienced pain at the end of the six months versus 21% in the placebo group.

The researchers conclude that coronary artery disease may be associated with a magnesium deficiency and that magnesium supplementation is an inexpensive and safe method of improving the quality of life for heart disease patients.

*Shechter, Michael, et al. Effects of oral magnesium therapy on exercise tolerance, exercise-induced chest pain, and quality of life in patients with coronary artery disease. **American Journal of Cardiology**, Vol. 91, March 1, 2003, pp. 517-21*

## Glucosamine sulfate cream for osteoarthritis

CLAYTON, VICTORIA, AUSTRALIA. Several studies have shown that glucosamine sulfate and chondroitin sulfate administered orally are effective in reducing pain associated with osteoarthritis of the knee. Glucosamine, however, is subject to degradation in the liver and is also taken up by non-joint tissue. The amount

actually reaching the affected knee joint is thus only a small percentage of the original oral dose. Chondroitin sulfate is known to be poorly absorbed from the gastrointestinal tract. In order to overcome these problems researchers at Monash University have evaluated a proprietary cream designed to be applied topically directly to

the affected area. The cream contains 30 mg/gram of glucosamine sulfate, 50 mg/gram of chondroitin sulfate, 140 mg/gram of shark cartilage (a source of chondroitin sulfate), 32 mg/gram of camphor, and 9 mg/gram of peppermint oil in a water-soluble cream.

The randomized, double blind, placebo controlled trial of the cream involved 59 men and women diagnosed with osteoarthritis of the knee. Thirty of the participants were given the proprietary cream to apply to the affected area as needed while the remaining 29 were given a placebo cream. All participants evaluated their pain daily on a visual analog scale running from 0 to 100 mm. Baseline pain score was 62 mm. The pain

score began decreasing on day one in the active cream group and after 8 weeks had dropped to 28 mm as compared to 46 mm in the placebo group. The participants applied the cream 2-3 times every day. The researchers estimate that the cream delivered about 60-120 mg of glucosamine sulfate and 156-300 chondroitin sulfate directly to the affected area. They conclude that topical application of the cream is a safe and effective way of treating pain associated with osteoarthritis of the knee.

*Cohen, Marc, et al. A randomized, double blind, placebo controlled trial of a topical cream containing glucosamine sulfate, chondroitin sulfate, and camphor for osteoarthritis of the knee. Journal of Rheumatology, Vol. 30, March 2003, pp. 523-28*

## Vitamin E helps prevent Alzheimer's disease

BOSTON, MASSACHUSETTS. Alzheimer's disease (AD) is a rapidly growing health problem in Europe and North America. The prevalence of AD is now 3% in persons aged 65 years rising to almost 50% in those over 85 years. The current cost to the economy of AD is estimated to be over \$100 billion per year and is exceeded only by the cost of heart disease and cancer. AD is characterized by neuronal degeneration and the presence of neurofibrillary tangles and senile plaques in the brain. There is now considerable evidence that inflammation and oxidative stress are crucial elements in the development of AD.

Vitamin E is highly effective in combating both oxidative stress and inflammation. A recent study carried out in the Netherlands found that people with a high intake of vitamin E from food (more than 15.5 mg/day) were 43% less likely to develop AD than were people with a low intake. Supplementing with vitamin E, on the other hand, did not decrease the risk of developing AD. Another study concluded that a high dietary intake

of vitamin C and vitamin E was associated with a reduced risk of AD, especially among smokers.

Vitamin E is not only a powerful antioxidant, but is also involved in cellular signaling and transcriptional regulation and has been shown to inhibit key events in inflammation. These latter properties, however, would appear to be exhibited only by natural but not by synthetic vitamin E.

*Martin, Antonio. Antioxidant vitamins E and C and risk of Alzheimer's disease. Nutrition Reviews, Vol. 61, February 2003, pp. 69-79*

**Editor's comment:** The failure of vitamin E supplements to prevent AD could be due to either or both of two factors:

- synthetic rather than natural vitamin E was used in the trials;
- it is gamma-tocopherol (the form of vitamin E found in most foods) that is beneficial and not alpha-tocopherol (the form of vitamin E found in most supplements).

## A daily multivitamin benefits diabetics

CHARLOTTE, NORTH CAROLINA. Common infectious illnesses such as upper respiratory tract infections (bronchitis, common cold), lower respiratory tract infections (pneumonia), influenza, gastrointestinal infection (stomach flu), and urinary tract infections account for a significant number of sick days and absenteeism. Researchers at the North Carolina School of

Medicine now report that taking a daily multivitamin pill (with minerals) may significantly improve an individual's resistance to infection. Their study involved 130 adults who were randomized to take a common, commercially available multivitamin pill or a placebo daily for 1 year.

At the end of the year 73% of the members of the placebo group reported having experienced one or more infections during the previous 12 months. Only 43% of the supplemented group had experienced infections. Infection-related absenteeism was also higher in the placebo group at 57% versus 21% in the supplement group. The differences were almost exclusively found in the subgroup of participants with type 2 diabetes. Here 93% of placebo takers reported an infection versus only 17% in the supplement group. This is likely due to the fact that many of the diabetic participants suffered from vitamin deficiencies at the beginning of the trial.

The researchers conclude that supplementation with a multivitamin may be highly beneficial for diabetics, particularly those with a nutrient-deficient diet. They also urge larger trials to conclusively determine the benefits of vitamin supplementation in the general population.

*Barringer, Thomas A., et al. Effect of a multivitamin and mineral supplement on infection and quality of life. **Annals of Internal Medicine**, Vol. 138, March 4, 2003, pp. 365-71*

*Fawzi, Wafaie and Stampfer, Meir J. A role for multivitamins in infection? **Annals of Internal Medicine**, Vol. 138, March 4, 2003, pp. 365-71*

## Prostate cancer and antioxidants

BALTIMORE, MARYLAND. There is growing evidence that certain micronutrients, more specifically antioxidants, may help prevent some forms of cancer. Selenium, for example, has been found highly effective in preventing prostate cancer. Researchers at the Johns Hopkins School of Public Health now report that gamma-tocopherol, the form of vitamin E found in most foods, is also effective in preventing prostate cancer. Their study involved over 20,000 male residents of Washington County, Maryland who had donated blood in 1974 and 1989. A total of 324 men had developed prostate cancer by 1996. These men were each matched with two healthy controls in regard to age, race, and date of blood donation. Comparing the blood levels of micronutrients in cases and controls found no significant differences in concentrations of alpha-carotene, beta-carotene, total carotene, beta-cryptoxanthin, lutein, lycopene, retinol, and

ascorbic acid (vitamin C). There was, however, a difference in gamma-tocopherol levels between cases and controls with controls having significantly lower levels. For the men who donated blood in 1989 it was observed that men with the highest gamma-tocopherol levels had an almost 5 times lower incidence of prostate cancer than did those with the lowest levels. There was also some evidence that higher circulating levels of retinyl palmitate (formed from vitamin A and stored in the liver) were protective against prostate cancer. The researchers conclude that gamma-tocopherol may help protect against prostate cancer, but note that lycopene did not appear to have any protective effect.

*Huang, Han-Yao, et al. Prospective study of antioxidant micronutrients in the blood and the risk of developing prostate cancer. **American Journal of Epidemiology**, Vol. 157, February 15, 2003, pp. 335-44*

## Fish oils help prevent stroke and heart attacks

SOUTHAMPTON, UNITED KINGDOM. Atherosclerosis increases the risk of stroke and heart attack because part of the atherosclerotic buildup (plaque) on the inner wall of arteries may dislodge and block smaller arteries in the brain and heart respectively and thus cut off the vital supply of oxygenated blood. Depending on its tendency to break loose from the artery wall plaque is classified as either stable or unstable with the stable form being the least likely to cause problems.

Researchers at the University of Southampton have just completed a clinical trial to see if fish oil supplementation would improve plaque stability and thus help prevent heart attack and stroke. Their study involved 162 patients who were awaiting carotid endarterectomy (an operation involving the removal of atherosclerotic deposits from the carotid artery feeding the brain). The patients were randomly allocated to receive a placebo, fish oil (omega-3 polyunsaturated fatty acid) or sunflower oil (omega-6 polyunsaturated fatty acid) daily from the time they entered the study until the endarterectomy during which

atherosclerotic plaque was removed for analysis. The placebo capsules contained an 80:20 blend of palm and soybean oils (a composition which closely matches that of the average UK diet); the sunflower oil capsules contained 1 gram of sunflower oil plus 1 mg of vitamin E (alpha-tocopherol); the fish oil capsules contained 1 gram of fish oil and 1 mg of vitamin E. The participants took 6 capsules daily providing a total to 3.6 grams linoleic acid (in the sunflower oil capsules) or 850 mg EPA (eicosapentaenoic acid) + 500 mg of DHA (docosahexaenoic acid) in the fish oil capsules.

The duration of supplementation varied between 7 and 189 days with the median being 42 days. Upon analysis of the removed plaque the researchers found that the supplemented fish oil (EPA and DHA) had been readily incorporated into the plaques and had resulted in favourable

changes. Plaque from fish oil treated patients tended to have thick fibrous caps and no signs of inflammation indicating more stability. Plaques from the control and sunflower oil groups, on the other hand, tended to have thin fibrous caps and signs of inflammation indicating less stability. The number of macrophages (large scavenger cells) in the plaque of fish oil treated patients was also significantly less than the number observed in the control and sunflower oil groups.

The researchers conclude that the increased plaque stability observed in the fish oil treated patients could explain the reduction in fatal and non-fatal heart attacks and strokes associated with an increased intake of fish oils.

*Thies, Frank, et al. Association of n-3 polyunsaturated fatty acids with stability of atherosclerotic plaques: a randomised controlled trial. The Lancet, Vol. 361, February 8, 2003, pp. 477-85*

## Supplements in the prevention of rheumatoid arthritis

ROCHESTER, MINNESOTA. Rheumatoid arthritis (RA) involves a persistent inflammation of the synovium of the joints eventually leading to destruction of the surrounding bone and cartilage. There is evidence that free radical attacks (oxidative stress) and the presence of pro-inflammatory cytokines are the major culprits and three American universities have just completed a study to determine if antioxidants in the diet or supplements could reduce the risk of RA by combating oxidative stress and inflammation. Their study involved 29,368 middle-aged women who were enrolled in 1986 at which time their diet and supplement usage was ascertained. The women were followed until the end of 1997 at which time 192 cases of RA had been definitely confirmed. The average age at onset was 68 years, range = 57-79 years.

Analysis of diet and supplement intake revealed a strong inverse correlation with dietary intake of the carotenoid, beta-cryptoxanthin. Women with an intake of more than 87 micrograms/day had a 41% lower incidence of RA than did women with an intake of less than 40 micrograms/day. Citrus

fruits, particularly oranges are good sources of beta-cryptoxanthin. Zinc supplementation with more than 15 mg/day conferred a statistically significant 61% reduction in RA risk while copper supplementation exhibited a trend for a significant risk reduction. Oddly enough, a high zinc consumption through the diet was associated with a trend towards a greater risk for RA perhaps indicating that zinc-rich food sources tend to contain compounds which increase the risk of RA. Consumption of cruciferous vegetables also showed a protective trend with 3 or more monthly servings of broccoli reducing risk by 35% as compared to consumption of less than 2 servings per month.

The researchers conclude that a high intake of beta-cryptoxanthin and supplemental zinc may materially reduce the risk of developing rheumatoid arthritis.

*Cerhan, James R., et al. Antioxidant micronutrients and risk of rheumatoid arthritis in a cohort of older women. American Journal of Epidemiology, Vol. 157, February 15, 2003, pp. 345-54*

## Meal composition and blood levels of amino acids

CAMBRIDGE, MASSACHUSETTS. Tryptophan and tyrosine are two important amino acids

involved in the synthesis of serotonin and catecholamines (epinephrine and norepinephrine)

respectively. Tryptophan must pass through the blood-brain barrier in order to be converted to serotonin. The blood-brain barrier's capacity for transporting amino acids is limited so tryptophan must compete with other large neutral amino acids (tyrosine, phenylalanine, leucine, isoleucine, valine and methionine) for access to the brain. This makes the ratio of tryptophan to the other amino acids (LNAA) crucial in determining how much tryptophan will eventually be converted to serotonin. A similar situation exists for tyrosine.

Researchers at the Massachusetts Institute of Technology recently carried out a small trial to see if the composition of breakfast would influence the tryptophan:LNAA and tyrosine:LNAA ratios. Their experiment involved 8 healthy, young volunteers who consumed a carbohydrate-rich breakfast (69.9 grams of carbohydrates and 5.2 grams of protein) and a protein-rich breakfast (15.4 grams of carbohydrates and 46.8 grams of protein) 3 to 7 days apart. The researchers found that the carbohydrate-rich breakfast increased tryptophan:LNAA ratio by approximately 10% (not statistically significant) over baseline while the

protein-rich breakfast decreased the ratio by about 30% (statistically significant). Similarly, while the carbohydrate-rich breakfast increased the tyrosine:LNAA ratio by a non-significant 5%, the protein-rich breakfast decreased it by a significant 20%. The total average difference in tryptophan:LNAA ratio between the carbohydrate-rich breakfast and the protein-rich one was 54% (28% for the tyrosine:LNAA ratio).

The researchers conclude that the composition of breakfast, or any meal for that matter, can result in substantial differences in plasma tryptophan ratio and thus probably in brain tryptophan concentration and serotonin synthesis. The meal composition also affects tyrosine ratio and may affect the synthesis of catecholamines. The researchers also noticed that while insulin concentrations rose sharply after the carbohydrate-rich meal there was very little, if any, increase after the protein-rich meal.

*Wurtman, Richard J., et al. Effects of normal meals rich in carbohydrates or proteins on plasma tryptophan and tyrosine ratios. American Journal of Clinical Nutrition, Vol. 77, January 2003, pp. 128-32*

## NEWSBRIEFS

**Cancer rates expected to double in next 17 years.** The World Health Organization (WHO) estimates that about 10 million new cases of cancer are diagnosed every year on a worldwide basis. This figure is expected to rise to 20 million by the year 2020. Smoking and unhealthy lifestyles are the main causes of cancer and it is estimated that smoking alone has been responsible for about 100 million deaths during the 20<sup>th</sup> century. Developing countries have only half the cancer rates as compared to the world as a whole. This is due to a later onset of the smoking epidemic and a generally healthier diet and lifestyle than that found in more affluent countries.

*British Medical Journal, April 5, 2003*

**Baycol compensation?** The German pharmaceutical giant, Bayer, is facing over 8000 claims for compensation from the fiasco involving its cholesterol-lowering statin drug cerivastatin (Baycol). The drug was withdrawn in August 2001 after having been linked to at least 100 deaths from rhabdomyolysis (an often fatal muscle disease). The first lawsuit came to trial in Corpus

Christi, Texas in early March 2003. Prior to the trial Bayer had sent a letter to 2000 local residents reminding them that it contributes about \$185 million to the economy of the state of Texas in payroll, taxes and support of local groups. The judge in the case commented that the sending of the letter was "outlandish". If Bayer is found guilty it may face bankruptcy.

*The Lancet, Vol. 361, March 8, 2003, p. 793*

**Nutrition bars may interfere with warfarin therapy.** Warfarin prevents blood clots by interfering with the synthesis of vitamin K-dependent coagulation factors. Vitamin K, in turn, inhibits the effect of warfarin thus necessitating the use of higher doses of the drug in order to attain adequate anti-coagulation effect. Researchers at the University of Iowa have found that many common nutrition and sports bars contain vitamin K in amounts high enough to interfere with warfarin action. A Luna bar, for example, contains 60 micrograms of vitamin K or about half the amount found in ½ cup of broccoli. Other bars such as Viactiv soft calcium chews, Balance and Clif bars also contain significant

amounts of vitamin K as does Boost and Ensure nutritional supplements. The researchers recommend that physicians inform their warfarin-using patients about these sources of vitamin K as they can significantly affect INR values.

*Annals of Pharmacotherapy, Vol. 37, February 2003, p. 302*

**New painkiller based on Botox.** Botulinum toxin or Botox is the most potent neurotoxin known to man and is highly effective in preventing muscles from contracting; however, it has no effect in blocking the nerves that transmit pain because it only binds to muscle cells. Keith Foster and his research team at the Centre for Applied Microbiology and Research near Salisbury in the UK reasoned that, if they could find a compound which would seek out and bind to the surface of pain neurons, and combined this with Botox then the result should be a very potent painkiller. Their search led them to the Mediterranean coral tree, *Erythrina cristagalli*. Protein from the coral tree binds only to pain neurons and not to any other cells. Combining the coral tree protein and Botox did indeed produce a very powerful painkiller without affecting other senses such as touch. The painkiller performed as well as morphine in experiments on laboratory mice and was still working 9 days after injection whereas morphine would have worn off in 4 hours. Human trials are planned for the near future.

*New Scientist, April 19, 2003, p. 14*

**Broccoli fights cancer.** Broccoli contains a class of chemicals called sulphoraphanes. Some sulphoraphanes inhibit the oxidizing enzymes that damage DNA and thus help protect against

cancer. The sulphoraphanes are released when broccoli is chewed. Dr. Nathan Matusheski of the University of Illinois has studied broccoli extensively and has found that in the common supermarket variety only 20% of the sulphoraphanes have anti-carcinogenic effects. However, by heating the broccoli to 60 degrees C the proportion of cancer-fighting sulphoraphanes increased to 80%. Dr. Matusheski points out that cooking broccoli in the conventional way does not improve its value as a cancer-fighting agent as the enzyme, which releases the sulphoraphanes in the first place, is also destroyed in the cooking.

*New Scientist, April 5, 2003, p. 25*

**Reduction in sugar intake urged by WHO.** The World Health Organization and the UN Food and Agriculture Organization have just released a report, *Diet, Nutrition and the Prevention of Chronic Disease*, which recommends that no more than 10% of daily calories should come from added sugar. The report claims that the refined sugars in soft drinks, cookies, etc. are emerging as a contributor to obesity and a major aggravator of diabetes. These sugars have also been implicated in syndrome X, which impairs the body's ability to handle sugar and is the forerunner of obesity and diabetes. The US Sugar Association, not too surprisingly, sharply disagrees with the WHO report and claims that a daily sugar intake of up to 25% of calories is quite OK. The Association now threatens to use its lobbying clout to get the US Congress to cut off the country's \$406 million annual contribution to the WHO.

*New Scientist, May 3, 2003, p. 12-13, 23*

## **SARS – More Questions Than Answers**

**by Maurice Mckeown, BDS, Ph.D.  
(our New Zealand correspondent)**

### **What is SARS?**

SARS stands for Severe Acute Respiratory Syndrome. The organism concerned primarily attacks the lungs. Victims develop a high fever, headache and dry cough followed by shortness of breath. Approximately 20-25% of patients go on to develop pneumonia and some of those die. You are much more likely to die if you have another medical condition or are over the age of 40. Remarkable progress has been made in the last few weeks by research laboratories worldwide.

### **How can scientists have made so much progress so quickly?**

Very recent advances in genetics have made it possible to compare suspect organisms with others. This is done by matching fragments of genetic material. Newly developed biological chips are now being used for



diagnosis. They contain hundreds of fragments of known viruses. The chip is exposed to fluid containing the suspect organism and any match-ups of genetic material can be detected using laser-scanning technology. Initial work at the University of California at San Francisco, suggested that the culprit is a corona virus. Then a Vancouver research team mapped out the entire genetic sequence of the virus in just 6 days. Now many more research teams are completing the genetic map of their virus samples. The WHO – World Health Organisation – has designated a dozen or so labs around the world to work together on the problem. They have been co-operating in unprecedented fashion, rapidly exchanging information via the Internet.

### **What has been achieved so far?**

The WHO now has enough evidence to definitively state that a corona virus is responsible. It is not a currently known variety. The corona virus family can infect animals and people. They are responsible for possibly 30% of colds and can also cause diarrhoea, particularly in children. No one is sure where this 'new' virus came from. Many of the earliest victims in Southern China had links to animals and food. The best current guess is that the virus previously lived in an animal species and has somehow been able to jump the species barrier to be able to infect people. The best candidate animals seem to be birds, pigs or cows. The WHO also believes that the virus can be held solely responsible for the disease. In other words they do not think it needs any help from other viruses or bacteria to cause the syndrome. Some scientists are not convinced. A few even doubt that the corona virus is the culprit. Some medical researchers think that other kinds of viruses (some have been found in samples from infected people) may be present in some of the more severe cases. Chinese scientists are claiming that a Chlamydia bacterium is also involved.

### **Where did the SARS virus come from?**

Comparisons of the genetic map of the virus with the map of other human and animal corona viruses has lead researchers to conclude that it is so different from others that it could not have arisen by a mutation of another known type. Scientists in China have now found strong evidence that the SARS virus, or one very close in structure, is present in three species sold for food consumption – the palm civet, the racoon dog and the badger. It is not yet clear if one, or all, is the primary infection source. Currently the civet is the front-runner. It is said to excrete large amounts of the virus in feces, urine and breath. All are carnivores and could have been infected by eating another mammal. The masked palm civet is reputed to be a good rat hunter. A number of people who handle civets have also tested positive for the presence of antibodies. Much work has yet to be done however.

### **How do you get SARS?**

It was initially thought that close contact with a victim was necessary. Initially a few individuals infected a large number of medical personnel. It is believed that the virus is transmitted in droplets of fluid expelled by coughs and sneezes. WHO epidemiologists have now concluded that the virus is transmitted almost entirely by large droplets reaching the mucous membranes of nose and lungs and not by feces or urine reaching the mouth. Only in rare circumstances are other transmission methods involved. It has also become clear that some victims are super infectious and can infect large numbers of people. No one knows why. Some authorities believe genetic factors may be involved.

When a Hong Kong high rise suffered an outbreak, it posed new questions about how the virus spreads. Investigation of the outbreak revealed that one visitor to the building infected 321 residents. The Hong Kong health authorities have done an extensive investigation. Their published report concludes that the virus was spread primarily by a poorly designed and maintained plumbing system, which resulted in an aerosol transmission of virus from a cracked sewer pipe. It is known that corona viruses are excreted in urine and faeces. They are also present in other body fluids. Other modes of transmission may also have been involved in the high-rise outbreak.

### **What symptoms are found in someone incubating SARS?**

Almost all patients have a fever and many have associated symptoms like headache, chills, muscle aches and general malaise. Although SARS is universally thought of as a respiratory condition this is not strictly true. In a study of over 1600 cases in Hong Kong it was found that only 61% showed respiratory symptoms. Most of the others (32%) had vomiting and diarrhoea. It is well known that animal corona viruses commonly

affect the GI tract or the respiratory system. It is not clear why the course of the disease varies in different people.

### **Could someone get SARS from a blood transfusion?**

Authorities are not completely sure. Genetic material from the virus has been found in the blood of sufferers. Many blood transfusion services are imposing restrictions on donors who have visited infected regions or who may have been quarantined because of contact with an infected person. Currently the WHO recommends that blood not be taken from anyone who has visited a SARS affected area with local recent transmission, until 21 days after they return home. Similar rules apply to quarantined individuals.

### **Can the virus be picked up by touching objects like door handles, elevator buttons or keypads?**

Until recently it was thought that the virus could only survive on a dry surface for a short time – possibly an hour or two. Now tests done by the CDC – the Center for Disease Control in the US - have shown that the virus can live for at least 24 hours. Other labs familiar with animal corona viruses say that some can live for many days in such circumstances. They become reactivated when exposed to moisture.

### **Can SARS be transmitted in an airliner?**

Yes that is possible. I think it is worth quoting in some detail from a recent WHO analysis of the problem as the issue potentially affects many of us. WHO reports “The number of flights during which transmission of SARS may have occurred remains at four. The total number of cases resulting from exposure during these four flights has been revised to 27. One flight alone, CA112, which flew from Hong Kong to Beijing on 15 March, is now known to have accounted for 22 of the 27 cases. WHO is aware of an additional 31 flights with symptomatic probable SARS cases on board. No evidence indicates that in-flight transmission occurred on any of these flights. No flights have been implicated in the transmission of SARS after 23 March 2003.

Complete data on seating information for all cases has not been obtained. However, it is now known that, on one flight, persons sitting seven rows in front and five rows behind a person with symptomatic SARS developed the disease. WHO is aware of four flight attendants, two of which were on the CA112 flight, who have become infected”

The risks are clearly extremely low overall, but if you sit fairly close to an infectious person you could be infected. There is some controversy about the ability of cabin air filtration systems to catch virus particles in the generally circulating air. Questions have also been asked about the maintenance schedules for such filtration systems. Air from toilets is vented directly outside and is not re-circulated. The ideal situation would be for all cabin air to be expelled: thus avoiding re-circulation. Airlines say that would cost too much. The UK based Aviation Research Institute claims that adopting the procedure would cost 20c per passenger per hour. Are you willing to pay the extra couple of dollars?

It has to be said however that only a small number of aircrew have come down with the infection, and proportionally even fewer passengers have contracted SARS. Some airlines have now implemented more stringent disinfecting procedures, even issuing masks on some routes. Perhaps you should ask your favourite airline just what they are doing to help keep you safe.

### **Is it of value to wear a mask in public?**

It is probably of very limited value unless you are the sufferer who is trying to avoid passing the virus to others. If masks fail to seal perfectly to the face, air is drawn in via the gaps instead of through the mask. A beard places one at a substantial disadvantage. Some authorities believe that moisture build up renders a mask useless in minutes rather than hours.

### **What is the incubation period?**

It seems to average about 3-5 days. Although instances of a 10-14 day incubation period are known and slightly longer periods suspected to occasionally occur. It is not known with certainty when a sufferer becomes infectious; although it is assumed to be when they become unwell and develop a dry cough and fever. The unpleasant possibility of the existence of apparently healthy carriers has not been ruled out.

### **Has a diagnostic test been developed?**

Yes - a number of labs around the world have developed rapid tests which provide results in an hour or two. These tests are based on the ability to identify the genetic material specific to the virus. They are currently being refined and commercial versions for wide distribution will be available very soon. At present they appear to be too unreliable for widespread use. An accurate diagnostic test will be very valuable because at present SARS can only be excluded by finding out that a patient has another known condition. Another kind of test, one for the presence of antibodies, has been developed. It identifies that the body has responded to the SARS infection. It will only be useful as a way of checking if a person has had previous exposure to the virus. It is believed that it should provide a valid reading about 21 days after the disease has begun.

### **How long will it take to develop a vaccine?**

In theory a vaccine seems possible in a very short time. Health authorities are however very reluctant to release a vaccine to large numbers of people without thorough testing. Some say a vaccine could be available in a year, others are projecting a 3-5 year time frame. There is also the problem of producing millions of doses to inoculate very large numbers of people.

### **Is there a drug to cure SARS?**

Sadly no – Some antiviral drugs plus steroids, have been tried with very limited success. A US lab is currently testing 2000 available drugs in the hope that one may be able to attack the virus. If this effort fails a new drug will probably be developed. But it is likely to take years to do so. Some researchers are now trying to tailor AIDS drugs to combat the corona virus. Possibly the most promising approach could be the use of protease inhibitors. Proteases are essential to the mechanism by which a virus exits a cell which it has infected. Protease inhibitors block specific proteases and thus prevent a virus from leaving a cell. They do not appear to affect normal cell function. A German research team at the University of Lubeck has discovered that a protease used by other cold viruses is almost identical to the one used by the SARS virus. An inhibitor for the cold virus protease is already in the final stages of testing. It probably won't work for SARS without modification. The German researchers believe that only a slight modification may be needed to create a SARS-compatible version. In the meantime Hong Kong doctors are trying a protease inhibitor cocktail approved for use in AIDS patients.

### **Will SARS eventually disappear or become harmless?**

It may become much less dangerous, no one knows. The chances of it disappearing forever are remote. Canadian researchers have found evidence of its presence in 20% of apparently healthy people from Asia. If this is confirmed it means that the virus is already present in substantial numbers of people who would act as a reservoir for future infection. If it normally exists in an animal population the same applies. It may become like other respiratory viruses and pop up intermittently in the winter season just like flu. The WHO now believes that the virus will appear again next Northern Winter even it subsides now. We have a new disease to contend with.

### **What happens if the virus changes just like the flu?**

This is a major fear for doctors. There may already be some evidence that it is changing. The death rate is rising slightly and the residents of the Hong Kong high rise were much sicker than other victims. Autopsies on some of those victims have revealed damage to many organs outside the lungs. Doctors don't know whether this represents a more severe infection. It could unfortunately also be the result of inappropriate medical treatment. Genetic sequencing of the virus is now being completed in many labs around the world using different virus samples. Initial comparison between Canadian and US virus samples gave an almost identical result. These new efforts around the world should provide a clearer picture about how variable the virus is and whether it is changing over time. At present it seems that there is little variation in strains in different parts of the world, but virologists say it is early days!

### **How can the spread of the virus be stopped?**

The best approach appears to be rapid isolation of suspects and the quarantining of their close contacts. Taking daily temperatures is being widely used in Singapore. That technology savvy society has now come up with a credit card style thermometer which is pressed unto the forehead to give a reading in 5-10 seconds. In Singapore 80% of victims have not passed the disease on to anyone else. A few incubators

have spread the disease widely in a number of countries. Unfortunately quarantine procedures in Hong Kong, Singapore, Taiwan and Toronto have been less than perfect. Some people do not obey instructions. Singapore now has an automatic heavy fine in place. Electronic tags and surveillance cameras are also being used. In Toronto legal action is being taken against a few people who have not complied with official directives. Some regions are having major successes. Vietnam may have completely arrested the spread of the disease and Singapore has had no healthcare workers infected for over three weeks. In China the practice of eating animals likely to carry the virus must stop. The import of civet meat into Hong Kong has now been banned.

### **Is the virus more dangerous than other deadly diseases?**

Some diseases are much more deadly. e.g. AIDS in which the mortality rate is ultimately very high. Ebola fever has a death rate of over 50%. On the other hand many diseases have a much lower mortality: Cholera 3-4%, the 1918 Spanish Flu estimated at 1-3% and malaria at 1-2%.

### **If I get SARS what is the chance of dying?**

The good news is that as many as 80% of sufferers get better without developing pneumonia. If you are young and healthy your chances are very good. Unfortunately for reasons unknown, some people get pneumonia and need to be treated in intensive care. The WHO says that the death rate is now about 5% but rising. This sounds reassuring but Dr Henry Niman – a Harvard professor, thinks they are wrong. He says their statistics are unsound. They are comparing the number of people who die with the number of people who currently have the disease. They should, he contends, be comparing the number who die with the number who get better. The official system is a bit like working out the match statistics before the game is over. Unfortunately the time between contracting the disease and dying is from 14 days to 8 weeks. By Dr Niman's reckoning the current death rate (second week of May) in Hong Kong is 18.25%, in Singapore it is 13.8% and in Canada 18.2%. Sobering news indeed.

Mortality is very closely linked to age. Below the age of thirty it is very low. From 40 to the age of 55 the death rate is about 8%. After that it climbs steeply. Mortality statistics are complicated by the existence of other medical conditions. Hong Kong authorities say almost 70% of those who have died had other medical conditions which may have contributed to their deaths.

Whichever figures you choose, they only apply to the current situation. Future trends are pure speculation. If however the current rate of spread continues, we are faced with some sobering possibilities. Currently the number of cases is doubling every 24 days. The number of deaths is doubling over a 14-day period. If such trends continue unchanged, year's end would see millions of cases worldwide.

### **What is the best way to stay healthy?**

Ultimately our immune systems are the best defence. All the usual advice applies. Eat a healthy diet, get enough sleep and try to avoid stress. A good multi vitamin pill might help. There are many herbs and potions that many swear by. It might also be useful to suck zinc lozenges at the first signs of feeling unwell. Zinc is known to be helpful in minimising the effects of cold viruses. A zinc nasal spray is currently being tested with promising initial results. It is also known that selenium deficient animals are more prone to certain viruses. A selenium supplement might be helpful.

Personal hygiene is very important. All authorities recommend regular thorough hand washing. If you are out and about the best plan is to carry an antibacterial hand gel. These alcohol-based rubs are carried by most pharmacies. You don't need water, so there is no necessity to dry your hands. Those air hand driers in public washrooms appear to be an excellent mechanism for blowing infected material all over the place. Tests have shown alcohol gels work much faster and better than anti-bacterial soaps. Hong Kong authorities have advised pressing elevator buttons with your car keys. (Automatic bank teller machine could require a little practice.) They also advise closing the toilet lid prior to flushing and recommend daily cleaning with a dilute bleach solution applied to toilets and all surfaces possible, particularly items like telephones. It may be necessary to wrap some computer keyboard in cling wrap.

## **If you have just returned from overseas, get sick and think that you might have SARS what should be done?**

Contact your doctor or hospital by telephone and ask for advice. Do not use public transport or a taxi to seek help.

### **Editor's Comment**

As Maurice points out, selenium-deficient animals are more prone to attack by certain viruses. Recent research has shown that a mild strain of influenza virus, influenza A/Bangkok/1/79, exhibits increased virulence when injected in selenium-deficient mice[1]. Could the same be the case for humans?

Selenium deficiency is pervasive in some Chinese provinces. Perhaps a concerted effort to ensure sufficient selenium in both animal and human food sources in the SARS affected provinces would be a worthwhile endeavour for the Chinese government and the World Health Organization. However, in the meantime it may be a good idea to ensure that you have a minimum daily intake of 200 mcg of selenium.

Doug Smith, a long-time subscriber living in California, has made two interesting observations:

- 1) Corona viruses are surrounded by a lipid (fat) containing membrane[2].
- 2) Many lipid-coated viruses are destroyed by monolaurin (a monoglyceride comprised of lauric acid and glycol).

Monolaurin is available over the Internet. Until something better comes along, it may be a good idea to have some on hand if you are concerned about exposure to the SARS virus.

Web sites for the latest information on SARS are as follows:

- Centers for Disease Control and Prevention - <http://www.cdc.gov/ncidod/sars/>
- World Health Organization - [www.who.int](http://www.who.int)
- SARS Reference - <http://sarsreference.com>
- SARS Watch - [www.sarswatch.org](http://www.sarswatch.org)

[1] Beck, Melinda A., et al. Selenium deficiency and viral infection 1. 11<sup>th</sup> International Symposium on Trace Elements in Man and Animals

[2] Dorland's Illustrated Medical Dictionary

## **BOOK REVIEW**

### **THE PALEO DIET**

#### **Lose Weight and Get Healthy by Eating the Food You Were Designed to Eat**

Loren Cordain, Ph.D.

John Wiley & Sons, New York, 2002 (hardcover or paperback)

Loren Cordain is a professor in the Health and Exercise Science Department of Colorado State University, is a respected expert on the early human diet, and has published significant original research in this area.

The thesis of "*The Paleo Diet*" is that we have essentially the genetic make-up and metabolism

of our Stone Age ancestors, and that the human genome has changed less than 0.02% in the last 40,000 years. The Stone Age or *Paleolithic* era actually covers the period from the first appearance of stone tools, about two million years ago, up to the end of the last Ice Age about 15,000 years ago. *Homo sapiens* are thought to have arrived on the scene in Africa about 100,000

years ago in the so-called Upper Paleolithic period. It is now reasonably well established that when *Homo sapiens* migrated out of Africa to Europe, Asia, and beyond, replacing earlier *Homo* species, they were still hunter-gatherer tribes, a situation that prevailed for thirty to forty thousand years prior to the advent of raising, grinding and storing grains and raising animals for food (see for example *The Seven Daughters of Eve*, by Bryan Skyes, W. W. Norton, 2001, for a fascinating and up-to-date discussion by an Oxford genetics professor of the use of female mitochondrial DNA in this context). Basic to Cordain's argument is the belief that the rate of mutation would not have allowed humans to adapt to the profound changes brought about in diet that came with the advent of agriculture and animal husbandry, which occurred about 10,000 years ago. Thus it is argued that modern man should still eat a diet based on the balance of nutrients in the diet of our Stone Age ancestors, i.e. based on our genetic blueprint, a diet which for example included nuts, seeds, roots, leaves, fruit, honey (rarely!), lean meat and fish. Thus the Paleo philosophy requires avoiding many of the diet changes that started about 10,000 years ago. Further rapid and profound changes have occurred in the last century with the development of the modern food and drink industry.

Cordain develops this thesis early in the book and then moves rapidly to apply its basic principles. In Part One he develops arguments for the proper balance of fat, protein and carbohydrate, and the types of each that are consistent with the Paleo Diet. The ground rules are simple: eat only lean meats, fish and other seafood, fruits and non starchy vegetables, and avoid cereals, legumes, dairy products and processed foods. Finally he discusses how, in his opinion, our modern diet went wrong and how his approach corrects the

problem. He also discusses the optimum balance of omega-3 vs. omega-6 essential fatty acids.

Part Two, titled "Losing Weight and Preventing and Healing Disease," includes a discussion of Syndrome X (also called the "Metabolic Syndrome") which he calls "The Civilization Disease" and attributes the syndrome, as have a growing number of nutritional scientists, to our modern Western diet with its emphasis on refined grains and sugars, which results in problems with glucose and insulin control, obesity, diabetes, heart disease etc. At the end of Part Two the author elaborates at some length on the proposed connection between the modern Western diet and a variety of diseases and health problems. An example is the relationship between celiac disease and cereal grains. Another is lactose intolerance. The remainder of the book provides detailed information on applying the principles of the Paleo Diet with a discussion of what to eat and what to avoid, meal plans, recipes, and the general principles of "Living the Paleo Diet."

This book is an important addition to the modern diet literature, and its theme is related to the debate regarding high vs. low carbohydrate diets, although the author's criticism of low-carb "fad diets" seems at variance with recent research results as well as most modern versions of this type of diet. Some readers may consider his restrictions too severe, and may find some of his beliefs debatable (e.g. "saturated fats are mostly bad"), but the general principles seem definitely worthy of serious consideration. *The Paleo Diet* is highly recommended reading for anyone trying to adjust their diet to optimize health.

**Reviewed by William R. Ware, Ph.D.**

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