

# Flu Prevention

## What the Broadcasters Don't Say

**Health leaders around the world** have become very concerned about a new strain of influenza from Mexico, H1N1, because it has crossed into other countries, including the U.S. Unfortunately, no new vaccine has yet been developed for this strain and the younger generations do not have natural immunity to it. Health officials are worried about the possibility of it mutating into a more virulent form and coming back this autumn, as it did in the influenza pandemic of 1918 that killed up to 50 million people. Indeed, health epidemiologists are warning that we are overdue for a pandemic of severe influenza.

Network health editors are admonishing people to wash their hands often, disinfect surfaces frequently, isolate sick individuals, avoid crowds if immunocompromised, and not to panic. As important as these safeguards are, it seems that the media is missing some important preventive steps. Is there something more that we can do to protect ourselves from getting this flu strain or any other one? Fortunately, there is, and the answer is largely wrapped up in one basic preventive approach—steady, healthful lifestyle practices.

The body has not been left without defenses against disease. Two particular components of the immune system, killer-T lymphocytes and natural killer cells, are especially valuable in the fight against influenza. If well-primed, they will, like air-force bombers, search out and destroy viruses and cancer cells. Let's look at some effective lifestyle measures that will boost the efficiency of these two frontline-players of the immune system.

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### Influenza microbiology in a nutshell

A virus contains either DNA or RNA, its genetic blueprint, and is surrounded by a protein coat called an envelope. Like all viruses, influenza viruses cause illness by entering host cells and replicating within them. The new viruses often kill and then burst from the host cell and go on to infect other cells and people. Influenza viruses are sphere-shaped and contain RNA. The outer envelope is studded with spike- and club-shaped proteins that help the virus invade host cells. The clubs, composed of hemagglutinin protein (HA), fuse with the host cell membrane, thus enabling the virus particle to enter the cell. The spikes, made of neuraminidase (NA), help the replicated virus particles to break out of the host cell membrane.<sup>1</sup> What a highjacking feat! The immune system is responsible for destroying viruses before they destroy us.

Unfortunately, the configuration of spikes and clubs on flu viruses change from season to season as the virus mutates. For example, in 1997, a new strain of influenza A in Hong Kong jumped from the poultry population to the human population. H5N1, as the strain was named, was originally contracted through contact with chickens.<sup>2</sup> It is a general law of microbiology that as more animals or people succumb to a virus, the stronger it becomes.

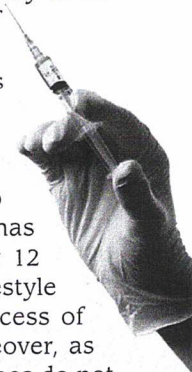
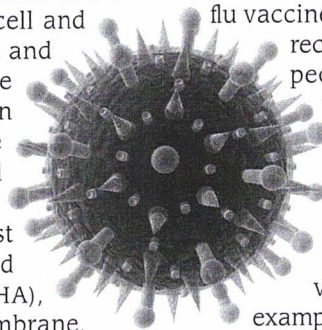
### Flu Vaccines

No doubt flu vaccines and anti-viral medication have saved many lives, but because the influenza virus can mutate so quickly and form new strains, these measures are not always effective. Influenza vaccinations are generally touted as being approximately 50 to 80 percent effective, depending upon the strain of the virus. In a recent edition

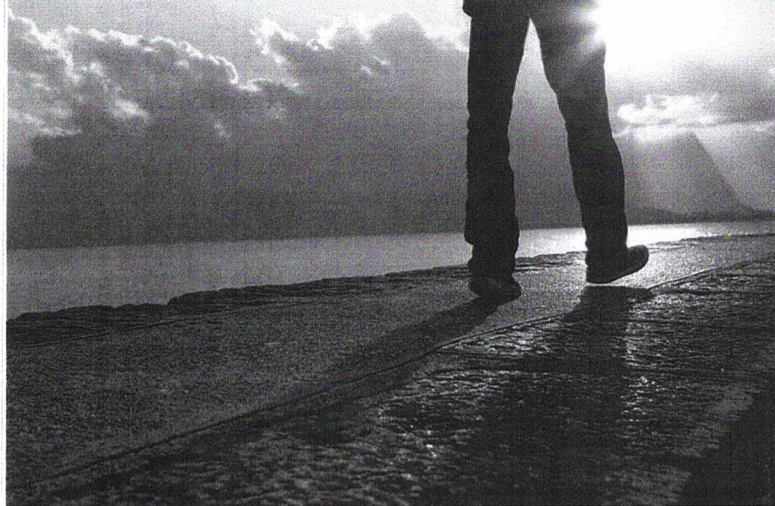
of the leading British medical journal, *The Lancet*, researchers recorded that flu vaccines are less effective than originally thought because former studies did not take into account the socio-economic status of the participants.<sup>3,4</sup> In some of the large studies regarding the efficacy of the flu vaccine, the well-to-do population received the vaccine, while poor people, who did not receive it, were used as controls. This study design could very well have affected the accuracy of the studies, because additional variables may have also played a part in the vaccines' effectiveness. For example, the poorer classes may not have had access to some of the benefits supporting health that the wealthier may have, such as ample fresh produce, helpful and warm living conditions, and opportunities for health care.

Italian epidemiologist, Dr. Demicheli, refutes claims of flu vaccines being 70 to 90 percent effective, stating this is "both wrong and misleading... and refers only to the ability of the vaccine to produce antibodies effective against the virus. But this is not the important measure of vaccine efficacy. Instead, we should measure the ability of the vaccine to prevent actual clinical disease, in this case, influenza. By this measure, he claims that vaccine efficacy is no greater than 25 percent."<sup>5</sup> Of course, some flu strains are more susceptible to vaccines than others.

Another point to consider is that from the mid 1990s to 2004, worldwide resistance to drugs used to treat influenza has increased by approximately 12 percent.<sup>6</sup> As we shall see, lifestyle factors often impact the success of vaccines for influenza. Moreover, as helpful as they may be, vaccines do not







provide full immunity and cannot be substituted for a healthful lifestyle.

Because the flu vaccine itself evokes a short-term pro-inflammatory response, it would be judicious for individuals getting it to adopt an anti-inflammatory program. This would include a largely plant-based diet, including severe restriction of sugar, sweets, or refined carbohydrates and fats, an ounce of nuts per day, adequate sleep, moderate daily exercise, and exposure to sunlight—all of which also bolster the immune system.<sup>7</sup>

### Lifestyle shapes immunity

Dr. Morimoto and associates at the Osaka University Graduate School of Medicine investigated the association between lifestyle and mental health status and natural killer (NK) cells. The lifestyle habits they examined included cigarette smoking, alcohol consumption, sleeping hours, working hours, physical exercise, eating breakfast, balanced nutrition, and mental stress. Here is what they discovered: participants with a good overall lifestyle showed significantly higher NK cell activity than those with poor lifestyle habits. Subjects who complained of an unstable mental status had significantly lower NK cell activity than those who reported having a stable mental status. Consequently, when the participants were divided into four groups by lifestyle and mental health status, it was found that subjects who had poor or moderate lifestyle and reported unstable mental status, showed the lowest NK cell activity, while those who had good lifestyle practices and reported stable mental status showed the highest NK cell activity.<sup>8</sup> In a later study, Drs. Li and Morimoto found that healthy lifestyles are also associated with significantly higher numbers of natural killer cells as well as higher levels of virus-killing enzymes in these cells.<sup>9</sup>

### Vitamin D combats influenza

Your body produces natural antibiotic-like compounds called antimicrobial peptides in the white blood cells. Bio-active vitamin D dramatically increases the activity of these germ-fighting compounds and epithelial cells of the respiratory tract.<sup>10</sup> On the other hand, vitamin D deficiency also predisposes children to respiratory infections. Ultraviolet radiation (either from sunlight or artificial sources) promotes vitamin D synthesis on the skin and reduces the incidence of viral respiratory infections. Nutritional epidemiologists estimate that as many as 50 percent of North Americans and Europeans have either an insufficiency or frank deficiency of vitamin D, both of which contribute to health problems. To solve this problem, get at least 15 to 20 minutes of sunlight a day without sunscreen (when the burn index is not too high) and consider taking a

vitamin D supplement, especially if you are indoors most of the day, are elderly, have dark skin, or live at a latitude greater than 40. Having your vitamin D level checked annually if you are at risk for developing an insufficiency is wise.

### Exercise: another immune booster

Researchers in Hong Kong discovered that individuals who never or seldom exercise increased their risk of dying from influenza from between five and a half to eight times. In contrast, those who exercised frequently decreased their risk by four to nearly six and a half times.<sup>11</sup> Furthermore, in a study done by scientists at Iowa State University, it was found that the subjects who exercised vigorously following a flu vaccine, had a higher concentration of both IgG and IgM.<sup>12</sup> Serum IgG is a class of antibodies that is found in all fluids in the body and is very important in fighting bacterial and viral infections, including influenza. Higher IgG levels are considered to be a good predictor of resistance to infection. IgM antibodies are found in blood and lymph fluid and are the first type of antibody made in response to an infection. They also cause other immune cells to destroy foreign substances.

Obviously, exercise is good, but are all types equal?

**Harmful levels of activity:** Researchers at the University of South Carolina found that exercise stress in mice was associated with an increase in susceptibility to influenza infection in the form of morbidity, mortality and symptom severity.<sup>13</sup> In humans it was found that very heavy exertion increased the risk of upper respiratory tract infections, due to negative changes in immune function and elevation of the stress hormones, epinephrine, norepinephrine, and cortisol.<sup>14,15</sup> This effect is significant because it would also lower a person's resistance to influenza. Another study found that following strenuous exhaustive exercise, the number of natural killer cells and T-lymphocytes is decreased and their activity is depressed for several days.<sup>16</sup>

**Moderation is the key:** Moderate exercise helps to protect us from influenza, but strenuous, exhaustive exercise increases susceptibility to influenza and other respiratory infections. Moderate exercise also increases antibody production, improves T-lymphocyte function in the elderly, and slows down the aging of the immune system.<sup>17,18</sup> This means that with moderate exercise, even older people can develop an increased resistance to viral infections, reduce the formation of cancer cells, and slow down the aging of the immune system.

How does a person know what level of exercise is considered "moderate," "vigorous," or "strenuous?" This will depend on the individual's health condition and ability. Exertion is scientifically measured in METs. Activity above five METs will encourage undesirable clotting in a healthy person and is considered detrimental to the immune system. Brisk walking is gauged at five METs, jogging at six METs. Because there is room for variance among individuals, a simple rule of thumb might be, if you cannot talk while exercising, the activity is too strenuous for your health.

### Temperance

Temperance is defined as the abstinence from all injurious agents and harmful habits, and the moderate use of all good substances and activities. Intemperance weakens the body's ability to fight disease. For example, alcohol suppresses natural killer-cell activity. Just two drinks of an alcoholic beverage decreases antibody production by 66 percent! Smoking also



decreases natural killer-cell activity but stopping the practice will improve it. In addition, smoking dries out the nasal passages and paralyzes cilia, the delicate hairs that line the respiratory tract and help sweep germs out of the body. Merely one cigarette can paralyze cilia for as long as 30 to 40 minutes! Exposure to second-hand smoke can increase susceptibility to upper respiratory and lung infections.

## Nutrition

Obesity is another condition that suppresses the immune system. On the other hand, wise calorie-restriction actually slows down aging of the T-lymphocytes. Likewise a high-fat diet slows antibody production and suppresses the immune system in general. But when the total fat intake is decreased merely 5 percent, from 30 percent of the total calories to 25 percent, T- and B-lymphocyte activity increases significantly. Furthermore, research indicates that reduction of fat intake from 32 to 22 percent of the total calories also improves the activity of the natural killer cells.<sup>19,20</sup> Another immune suppressant is sugar, which works in a dose-related fashion and lowers our resistance. A high-salt diet also depresses certain viral-killing compounds in the immune system. Stay away from junk foods if you want to seriously reduce your risk of getting the flu.

Eating foods rich in antioxidants gives the immune system an extra boost. If you are taking a little extra vitamin C, don't forget to increase your intake of vitamin E as well, because adequate amounts of this vitamin also slow down the aging of the immune system. Studies show that vitamin E-induced enhancement of immune functions is associated with

significant improvement in resistance to influenza infection in aged mice as well as a reduced risk of acquiring upper respiratory infections in nursing home residents.<sup>21,22</sup> Remember, however, that taking too much of one antioxidant or vitamin with marginal intakes of the others actually creates more free radicals in the body—a condition we don't want.\*

The trace element zinc is essential for proper relationships between the nervous, endocrine, and immune systems. Dietary zinc is an important immunoregulatory agent with anti-inflammatory roles and is necessary to balance helper-immune cells. Chronic diseases that are often associated with lowered levels of zinc include bronchial asthma, rheumatoid arthritis, Alzheimer's disease, lupus, type 1 diabetes in children, and Crohn's disease, all of which have an autoimmune component. Food sources of zinc include nuts, legumes, whole grains, and sea foods. Although fish contains zinc, we cannot recommend its consumption due to its potential toxic metal and pesticide content. Vegetarians, however, may need to have their zinc levels checked.

## Water—another biologic hero

In flu prevention, the use of water—both internally and externally—should be emphasized. The brain modulates the immune system by sympathetic and parasympathetic nerves (autonomic nervous system) to lymphoid organs. The sympathetic nerve activation predominates in stressful situations. Parasympathetic activity helps us to perform the routine jobs of daily life. Research suggests that adequate hydration improves the balance between these two branches of the autonomic nervous system. Drink at least eight glasses of water, which can include herb tea, every day. Adequate hydration is essential for the immune system.

If you do not have circulatory or other serious medical problems, contrast showers can be quite effective in warding off infections. Start with hot water for 2 to 3 minutes, followed by cold for about 30 seconds, as tolerated. Repeat this cycle three times. This simple treatment will stimulate the circulation of the immune cells throughout your blood.

## Get your sleep!

Sleep, in itself, can change one's immune system. Good quality of sleep helps to replenish the cells of the immune system. Researchers from Stanford

University discovered that the body's peak disease-battling, immune-system activity occurs during the night; this activity is weakest during the day. Partial sleep deprivation reduces the activity of natural killer cells. Even a modest sleep deprivation for part of the night can reduce the killing ability of the natural killer cells by almost 30 percent.<sup>23</sup> Sleep deprivation also reduces the effectiveness of flu vaccines.

## You are what you think

Psychological factors have been shown to influence immune response and alter susceptibility to infection. Early in the 20th century, health educator Ellen White observed, "The relation that exists between the mind and the body is very intimate. When one is affected, the other sympathizes.... Grief, anxiety, discontent, remorse, guilt, distrust, all tend to break down the life forces and to invite decay and death."<sup>30</sup>

Scientific studies continue to confirm these relationships. Researchers at Iowa State University found that greater optimism and a greater number of social interactions were associated with higher levels of influenza-specific IL-10 following the flu vaccine.<sup>24</sup> This is important because IL-10 is a very useful anti-inflammatory agent. The researchers also found that individuals with a greater number of social ties may have decreased susceptibility to infection.

In contrast, a persistent negative outlook erodes both the ability of the NK cells and killer T-lymphocytes to destroy viruses and cancer cells. The emotions and reactive thinking common in depression—helplessness, loneliness, and hopelessness—lack of social support, and unhealthy suppression of these feelings not only depress the mind but also the immune system.

## The stress factor

Both chronic and acute stress decrease the percentage of T-helper lymphocytes and the numbers and function of natural killer cells.<sup>31</sup> Stress increases the secretion of corticosteroids. When the level of these hormones become elevated, the ability of the lymphocytes to multiply is decreased. Stress reduces the ability of natural killer cells, as well, to

\*Of course, nothing can surpass getting our nutrients and phytochemicals from a variety of whole foods. Nonetheless, wise vitamin and mineral supplementation can prove helpful for those individuals who have certain chronic conditions and is essential for those eating a restricted diet, including one less than 1,500 kcal.





make interferon, a protein that interferes with viral multiplication. The researchers from Iowa State University also found that high stress was a significant predictor of reduced anti-influenza IgG and influenza-specific IL-2.<sup>24</sup> Among its other jobs, IL-2 stimulates antibody production.

Chronic stress has also been found to be related to reduced antibody titer\*\* and IL-2, following influenza vaccination in older adults.

If an individual possesses high anxiety and poor emotional stability, stressors can result in a significant decline in NK cells. But, amazingly, if the individual has high emotional stability and low anxiety, stress actually improves NK cell activity.<sup>32</sup> Realistic optimism, security, confidence, trust, faith, and a will to survive based on self-discipline improve the natural killer cells' job performance.<sup>33</sup>

Fortunately, there is good news for stressed individuals also: problem-solving techniques and coping skills can improve NK cell activity. Cognitive-behavioral therapy (identifying distorted thought patterns and destructive practices and replacing them with healthy ones) and relaxation can also improve the efficiency of the immune system.<sup>34</sup>

### The value of connecting

Psychosocial influences not only influence the effectiveness of the flu vaccine, but directly impact the immune system itself. For example, studies show that loneliness appears to have a significant impact on physical health, being linked detrimentally to worse sleep and immune capacity over time in the elderly.<sup>25</sup> In college students, elevated levels of loneliness throughout the semester, as well as small social networks, were found to be independently associated with diminished antibody response to the influenza vaccine. Those with both high levels of loneliness and a small social network demonstrated the lowest antibody response.<sup>26</sup> Individuals who are chronically socially isolated actually show changes in certain genes that cause more proinflammatory activity to predominate.<sup>27</sup> On the positive side, good social relationships can serve as a buffer during both acute and chronic stressors, protecting against immune suppression.

### The depression factor

Depression increases the production of proinflammatory molecules that adversely impact the body and consequently con-

tribute to prolonged infections, delayed wound healing, chronic disease, frailty, and morbidity. Additionally, depression decreases the ability of T-lymphocytes to respond to viruses in an appropriate and efficient manner.<sup>28</sup>

Mental depression also often reduces the effectiveness of flu vaccines. Scientists at the Institute for Behavioral Medicine Research in Ohio found that in older individuals, "even a modest number of depressive symptoms may sensitize the inflammatory response system and produce amplified and prolonged inflammatory responses after infection and other immunological challenges, such as those from a vaccine. Additionally, these sustained or amplified inflammatory responses could possibly accelerate a range of age-related diseases." In other words, our mental state helps to determine whether the flu vaccine will benefit us or aggravate unhealthy inflammatory disorders found in many chronic conditions such as cardiovascular disease, osteoporosis, arthritis, type 2 diabetes, certain cancers, periodontal disease, frailty, and functional decline.<sup>29</sup>

### Two neglected remedies

Be sure to get a steady supply of fresh air, day and night, year round. The best way to do this is to spend as much time as possible outdoors. During winter, when people tend to spend more time indoors, keeping windows slightly open can often decrease the risk of sickness. Because dry, heated air can make the respiratory tract more prone to acquiring infections, adding humidity to the air can also be helpful. Even during warmer weather, when individuals spend much time in air-conditioned buildings, it is important to get good ventilation. Keeping air ducts and filters clean summer and winter also promotes better health.

Not only fresh air, but deep breathing is needed. It improves the circulation of the blood and consequently of the white blood cells that circulate in the blood.

And, sing or hum a song. Not only can it improve one's mood, but humming and singing can actually prove therapeutic! Concentrations of nitric oxide in healthy sinuses are high and nasal nitric oxide is known to be increased 15- to 20-fold by humming, compared with quietly exhaling. Nasal nitric oxide is known to be broadly antifungal, antiviral,

and antibacterial.<sup>36</sup> Ask God's creatures. Starlings, who are robust singers, exhibit enhanced immunity as compared to non-robust singers. Studies show that singing also increases secretory IgA.<sup>37</sup> IgA is a class of antibodies that guard the mucus membranes in the body, including the respiratory mucosa. Of course, you might not want to sing around others if you have an upper respiratory tract infection, since it could spread your germs. Incidentally, even listening to chorale music reduces levels of the hormone cortisol, which exerts immunosuppressant effects when produced in excessive amounts.

### Nature's medicine cabinet

Nature provides us with an arsenal of useful plants that can help fight infections. When you have been exposed to a virus or your immune system is down, try sipping some immune-bolstering herbal tea such as astragalus or echinacea. Garlic is one of the best herbs to use; it enhances immune functions and possesses antibacterial, antifungal and antiviral properties.<sup>38</sup> Aged garlic improves natural killer cell activity and is also useful for preventing psychologically-induced immune damage.<sup>39</sup> If you have been exposed to the flu virus, try this therapeutic drink: blend together one quart of warm water, one or more peeled garlic cloves, and one lemon or grapefruit, peeled and seeded; drink one cup four times a day.

Black elderberry also activates the healthy immune system and is effective against eight known strains of flu viruses. In addition, it reduces the duration and severity of symptoms if the flu is contracted.<sup>40</sup> According to expert herbalist, James Duke, elderberry can actually help prevent viruses from entering the respiratory tract. Some evidence indicates that astragalus root, which also has antiviral properties, can help restore depressed immune function as well.<sup>41</sup> And several laboratory and animal studies show that echinacea can enhance activity of the immune system, relieve pain, reduce inflammation, and exert antiviral effects.<sup>42</sup>

For general immune enhancement, use one to two grams dried root or herb in

\*\*Antibody titer is a laboratory test that measures the presence and amount of antibodies in blood. The antibody level in the blood is a reflection of past exposure to an antigen or a protein or toxin that the body does not recognize as belonging to itself. The body uses antibodies to attack and remove foreign substances.

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