The leading cause of death in the U.S. is heart disease followed closely by cancer and stroke. These three illnesses together resulted in more than 1.4 million deaths in 2001, according to statistics compiled by the Centers for Disease Control (CDC). Also among the top ten causes of death were diabetes, Alzheimer’s disease, influenza, emphysema and kidney disease.

New research has shown a common factor linking together each of the above diseases. It’s been called a “secret killer” and many lives could be saved knowing how to minimize chronic inflammation. The key to optimal health lies in balancing inflammation and immune defense and a new technology is now available which balances the immune system without the use of drugs. A balanced immune system will safely suppress inflammation while optimizing immune function. Since nine of the top 10 causes of death are affected by the immune system, this new discovery will lead to an era of disease treatment far different from what is currently practiced. Cardiologists are now consulting with oncologists, allergists with nephrologists and rheumatologists with neurologists to better understand this new development. This convergence in medicine is a result of several timely observations connecting aspects of each of the above diseases.

Cardiologists studying heart disease realized that factors other than high cholesterol indicated who was at greatest risk of developing cardiovascular disease. One of these was a small molecule known as C-reactive protein or CRP. CRP is a key indicator of inflammation throughout the body. For example, after a cut, an injury, or a bacterial or viral infection, levels of specific immune factors (cytokines) and CRP rise in response to this breach in defense. High cytokine levels indicate an elevated inflammatory state and activation of the immune system. This is how the immune system normally responds to events that threaten the body. After the immune system has healed the injury, sealed the wound, or fought off the bacterial or viral infection, the immune response is “turned off” and cytokine and CRP levels return to normal.

Sometimes the immune response does not completely turn off, causing low-grade inflammation. This chronic inflammation greatly increases the risk of cardiovascular disease through a complicated cascade of events that take place in the artery wall, leading to deadly heart-stopping blood clots. Therefore it is important to know the level of chronic inflammation present to both monitor risk and reduce the incidence of sudden heart attack or stroke.

Colon cancer is second only to lung cancer in deaths among cancer patients. Inflammatory bowel disease (IBS), ulcerative colitis and Crohn’s disease greatly increase the risk of developing colon cancer. All three involve mild to severe inflammation of the lower digestive tract. Scientists are now convinced that chronic inflammation of the gastrointestinal (GI) tract is closely linked to the future development of colon cancer. In support of this hypothesis, several anti-inflammatory drugs have been shown to reduce the risk of developing colon cancer.

Colon cancer is not the only cancer that has an inflammatory component. Cancer cells often form at sites where there is chronic inflammation. The inflammatory process releases a host of free radicals that destroy healthy tissue and can create genetic mutations that develop into cancer. Once cancer cells appear, a healthy immune system normally destroys these aberrant cells before they can threaten the body. However, if the immune system fails to respond effectively and the cancer tumor becomes established, then the immune system sends in inflammatory cytokines and growth factors that speed the “healing” process at the site of inflammation. These growth factors end up feeding the tumor and accelerating its growth.

Diabetes mellitus or type 2 diabetes is the sixth leading cause of death in the United States. Diabetes is also the leading cause of blindness, lower limb amputations and kidney failure. The number of cases of diabetes is expected to double and triple in some nations over the next decade making diabetes a global epidemic. This illness is characterized by high blood sugar levels created when cells do not respond properly to insulin (insulin resistance). Chronic high blood sugar coupled with alterations in blood fats, lead to the release of inflammatory factors that accelerate the development of cardiovascular disease. New research suggests that elevated levels of CRP and inflammation are responsible for the development of insulin resistance. Those who are insulin resistant will eventually develop type 2 diabetes. This intimate relationship between inflammation and diabetes offers hope that those who can minimize or reduce chronic inflammation can prevent or forestall the development of diabetes.

Alzheimer’s disease begins gradually and is characterized initially by mild memory loss. As the disease progresses, memory loss affects cognitive thought, speaking, understanding, reading and writing. Eventually, the patient is unable to recognize and interact normally with other people. This is a devastating disease both for the patient and his or her...
family. Scientists have discovered that inflammation is the core of the neurofibrillary plaques present in the brains of Alzheimer’s patients and anti-inflammatory medications seem to slow progression of the disease. However, long before Alzheimer’s disease symptoms are apparent, chronic inflammation will cause the loss of a significant number of brain cells contributing to memory loss and future brain dementia. Therefore, to maintain your mental faculties as you age, reducing inflammation must be a goal of your health program.

**Rheumatoid arthritis** involves inflammation in the synovium or lining of the joints. It is typically a chronic, systemic disorder that affects the entire body. The inflammation of the synovium causes pain, stiffness and swelling. This inflamed synovium triggers a release of inflammatory factors that in turn digest bone and the underlying cartilage greatly decreasing mobility of the affected joints. While rheumatoid arthritis is a more severe form of inflammation, (autoimmune disease), it responds to treatments that reduce inflammation. The cancer drug, Methotrexate, is commonly used at a low dose to reduce inflammation by suppressing the immune system.

Rheumatologists studying the effect of new COX-2 anti-inflammatory drugs for arthritis (e.g., Celebrex and Vioxx) noticed that patients on these drugs had a lower incidence of the colon polyps that are indicative of colon cancer. Meanwhile, allergists noticed anti-inflammatory asthma medications appeared to reduce the risk of heart disease, and patients taking the statin drugs (e.g. Mevacor, Lovastatin) to lower cholesterol also had a corollary benefit – reducing the risk of Alzheimer’s disease. Such complementary evidence suggests why aspirin, a well-known anti-inflammatory has been effective in reducing the risk of a heart attack.

Taken together these facts indicate that chronic inflammation can significantly increase the risk of many chronic diseases, including heart disease, cancer, diabetes, arthritis and Alzheimer’s disease. This is particularly important, as these diseases become more common as the American population ages. This knowledge can guide millions of older Americans with the information necessary to maintain optimal health throughout their lifetime.

**What Causes Chronic Inflammation?**

The immune system is responsible for controlling the inflammatory response. Acute inflammation is the primary defense of the immune system to protect our bodies against bacteria, viruses, parasites and other invading organisms. In addition, the immune system controls the healing response, whether to a cut, sprain, strain, sports injury or post-surgery. However, basic aspects of our high-stress lifestyle significantly inhibits the immune system’s ability to function properly, which results in a state of chronic inflammation.

Two lifestyle factors are **proper sleep** and **exercise**. It is a well-known fact that exercise is necessary for optimal health. With regards to inflammation, exercise activates the antioxidant defense system, lowering the levels of free radicals and reducing inflammatory factors that sustain chronic inflammation7. Exercise also burns excess fat which is important since new research indicates that fat cells release inflammatory factors causing a chronic inflammatory state. Thus the more fat cells you have, or the more overweight you are, the more likely you will have chronic inflammation. This would explain why overweight and obese individuals are at greater risk of developing diabetes, heart disease, Alzheimer’s or arthritis.

**Lack of proper sleep** is another factor that triggers inflammation. In several scientific studies, people who were sleep deprived had higher levels of inflammatory factors in their blood, while those who had seven or more hours had normal blood levels. Thus, failure to get regular exercise and proper sleep can increase inflammation and lead to the development of chronic disease.

Another factor affecting the immune system is the **American diet**. A diet high in simple carbohydrates, a habitual lack of fruits and vegetables coupled with foods high in the wrong fats, force the immune system into a chronic inflammatory state. A high carbohydrate meal stimulates a rapid rise in insulin and the release of many pro-inflammatory factors. Conversely, a meal of **complex** carbohydrates and higher protein content keeps inflammatory factors in check. This may be the wisdom underlying the success of the popular Atkins diet. Even though most mothers taught their children to “eat your vegetables,” the majority of Americans fall far short of the recommended five to nine daily servings of fruits and vegetables. Fruits and vegetables contain specific vitamins (vitamin C and E and phytonutrients), which have been shown to reduce inflammatory factors in the blood.

In addition, our diets are too high in certain essential fatty acids (EFAs) and too low in others. We consume too much of a poly-unsaturated fatty acid known as omega-6 and not enough of a complementary essential fat known as omega-3. A healthy diet would have an omega-6 to omega-3 ratio nearly one to one (1:1). However the average American diet contains as much as 10 to 20 times too much omega-6 fats. This high consumption of omega-6 fatty acids causes the immune system to manufacture and release inflammatory factors that engage the body in a chronic state of inflammation.

New research in hormone research (endocrinology) adds another twist to the inflammation puzzle. As adults age, there is a related decline in the male and female hormones, testosterone and estrogen respectively. As levels of these hormones fall with advancing age, indicators of chronic
inflammation rise.26,27,28 This rise in inflammation accelerates the development of inflammation-related diseases. However, this research is complicated by the fact that women taking oral contraceptives also have an increased risk of chronic inflammation.29 Clearly, understanding the complexity of the immune system and how it responds to specific age and drug-related events continues to be a mystery that modern medicine will hopefully solve.

**Factors that Minimize Inflammation**

If inflammation is the key factor underlying so many chronic diseases, why can’t we simply take one pill and turn off the immune system? This is exactly what many pharmaceutical companies are striving to accomplish. The profits from a FDA-approved, anti-inflammatory drug that would treat all these chronic diseases would be a huge windfall to any drug company. Unfortunately, it is not that simple.

The immune system is an extremely complex, multifaceted interconnection of multiple organ systems together designed to protect the body from enemy attack and support the healing process. Any drug that turns off the immune response exposes you to greater risk of developing cancer, infectious disease or viral illness. Thus a true “magic bullet” would modulate the function of the immune system by establishing a balance between inflammation and defense.

**Lifestyle factors** clearly influence inflammation, and modifying your lifestyle will attenuate the inflammatory response and reduce your risk of future chronic illness. As mentioned above, many individuals take anti-inflammatory drugs like Celebrex (for arthritis), Methotrexate (for rheumatoid arthritis), Metformin (for diabetes) or Lovastatin (for cholesterol). While these drugs have significant benefit for each specific illness, they can also cause a variety of side effects by suppressing the immune response.

Important **dietary factors** influencing the immune system are the essential fatty acids, omega-6 and omega-3. A prudent dietary change would be to reduce consumption of omega-6, vegetable oils such as corn and safflower oils, and increase consumption of olive and flax seed oils. The ideal omega-3 essential fatty acids are those derived from fish. Although flax seed oil is an omega-3 fat, its effectiveness is limited, because it must first be metabolically converted into the active form, EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid). When deciding on an omega-3 fish oil supplement, it is important to choose a fish oil derived from whole fish, preferably a cold, deepwater fish like salmon to minimize the risk of environmental contamination.

**Fruits, vegetables and nuts** contain a wide variety of nutrients and are high in specific antioxidants. In particular, vitamin E present in nuts and vitamin C from citrus fruits are essential in controlling inflammation. However too much fat-soluble vitamin E can also suppress the immune response and lead to sepsis, a fatal bacterial infection. Moderation is the key with all vitamin/mineral supplements, especially fat-soluble vitamins. Fruits and vegetables also contain specific fat-soluble and water-soluble phytonutrients known as carotenoids and flavonoids respectively, which have been shown to support the function of the immune system. For those who are unable to consume the daily recommended five to nine servings a day, there are now dietary supplements available that contain these important phytonutrients in capsules.

**Balance is the Key**

The key to proper immune function is **balance**. Drugs must be closely monitored, as they can suppress the immune system too effectively. If you turn inflammation down too low, you are at risk of developing cancer, tuberculosis, bacterial, viral or parasitic infections. If you boost the immune response too high, you are at greater risk of autoimmune disease or chronic inflammation and increased risk of heart disease, arthritis, diabetes or Alzheimer’s disease. While the ideal lifestyle supports a healthy immune system, in our modern society few of us realistically and consistently accomplish this. The **good news** is that a new highly effective technology has been developed that may be the answer to establishing balance of the immune system without drugs via a feature common to all mammals! This technology, known as hyperimmune egg, is a powerful and efficient way to balance our immune system.

Every nursing mother is familiar with this mammalian feature. As a mother breastfeeds her newborn child, her milk supplies nutrition for the growing infant along with specific **instructions**, or immune factors, which support the function of the newborn’s immune system. This delivery of immune information is called the passive transfer of immunity and is common to all mammals. Breast-fed babies are healthier than those bottle-fed and there is good evidence suggesting that breast-fed babies are less likely to suffer allergies later in adulthood.32,33 Immune factors present in mother’s milk promote balance of the infant’s immune system offering both protection from infection and control of inflammation.34

Chickens, however, don’t breastfeed! Instead, chickens lay eggs and within each egg is a concentrated source of immune information for the chick. When chickens are exposed to a variety of enteric (heat-inactivated) human pathogens, these (hypermune) eggs contain concentrated immune factors that assist the immune system in achieving proper balance. This new technology contains immune information that allows the immune system to choose which instructions (immune factors) it needs to either support function or suppress inflammation.35,36 While omega-3 fats and antioxidant supplements provide the raw materials to support the immune system,
hypermune egg provides the fundamental instructions or blueprint to allow the immune system to self-regulate and achieve perfect balance.

Summary

The fact that the immune system and inflammation contribute to nine of the 10 most common causes of death, is a major breakthrough in modern medicine. This important discovery enables everyone to make simple changes that minimize inflammation and enhance their health.

Clearly, no drug will allow you to achieve true immune balance. Common-sense lifestyle changes such as proper sleep, exercise and maintaining your ideal weight coupled with sensible food choices like complex carbohydrates, fruits, vegetables and essential fats are the foundation for good health. The combination of these raw materials and hyperimmune egg technology together give you the essential building blocks and the blueprint to build a strong yet balanced immune system. This will allow you to achieve health and longevity, free of disease well into your retirement years. 

As 78 million baby boomers progress into their golden years, they are championing a significant amount of medical research into the diseases of aging and the aging process. “Boomers” have substantially affected the American economy over the past 50 years as they created a strong demand for specific products as they matured. Now, as they approach their retirement years, boomers are creating a growing demand for wellness solutions to remain healthy and preserve their youth. Economists have predicted that this desire for health will swell the 200 billion currently spent on wellness products into a trillion dollar industry. New technologies such as hyperimmune egg may be their wellness product of choice due to it’s powerful effects upon the immune system and chronic inflammation. This new technology along with the recent alliance among medical specialists to study inflammation, means that there is great promise in the future that healthy aging and longevity will soon become an everyday reality.

About the author

Dr. Winkel is a research scientist trained in neurobiology, development biology and cell physiology. He received his Ph.D. from the University of California San Francisco, School of Medicine and studies complementary approaches to traditional medicine based upon current scientific research. He conducts seminars on a variety of topics including stress reduction, the immune system, neurological disorders, children’s environmental health and athletic performance. Dr. Winkel is also a seven-time World and 21-time National Cycling Champion, a former member of the U.S. Postal Service Masters Cycling Team and recognized internationally as one of the top American master athletes. He is a member of the Pikes Peak Toastmasters Club and serves on the board of the Colorado Velodrome Association. He has two children and lives in Colorado Springs, CO. For more information e-mail: drwink@me.com

References


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**For information about hyperimmune egg technology contact:**

Glen Winkel, Ph.D.
(719) 685-9252
drwink@mac.com
www.GlenWinkel.com
www.EggADay.com